Evaluation of PhilCAT-DOH Public Private DOTS Models

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Current Trends in TB Management by Private Physicians in the Philippines

A Survey in Five Private Health Settings

Philippine Coalition Against Tuberculosis
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Contents

Preface

This research report has been prepared by the Philippine Coalition Against Tuberculosis (*PhilCAT*) to provide baseline information about trends in TB management among private physicians in the Philippines. Data were collected from surveys conducted in five private health settings.

The objectives of the report are:

- To describe the background characteristics of private physicians in managing adult TB patients;
- To provide information on the private physicians' medical practice including the variability in their TB treatment practices; *and*
- To determine the private physicians' awareness and utilization of the NTP and the DOTS Strategy.

I. Introduction

A. Background and Rationale

Almost 50 years have passed when an effective treatment for tuberculosis (*TB*) was first introduced. However, latest data from the World Health Organization (*WHO*) reveal that more and more people get infected and die with TB. Nearly a third of the world's population is infected with the TB bacilli and at risk of developing active disease.

About 8.4 million people develop active TB every year and 2 million of these die.

TB accounts for 2.5% of the global burden of disease, for 26% of preventable deaths and is a leading infectious cause of death among young women.

An estimated 1.87 million people died of TB last 1997 and the figure continues to rise, in part with the spread of HIV infection in many African countries and other parts of the world.

In the Philippines, the incidence of TB remains to be one of the highest in the world, with an estimated incidence of 330 per 100,000 population. This makes the Philippines one of the 22 high-burden countries for TB, being the 7^{th} globally and 2^{nd} only to China in the Western Pacific Region.

To address the TB problem, WHO developed a case management strategy, the Directly Observed Treatment Short-course Strategy, or what is now popularly known as the DOTS strategy. It is the principal case management intervention for TB control and has proved to be the most cost-effective strategy in countries like Peru, China, Viet Nam, Nicaragua and Guinea, where cure rates rose in areas covered by DOTS.

The Philippines adopted DOTS in 1996 and since then DOTS coverage has increased from less than 15% to an estimated 60% by end of 2000. The country has achieved a success rate of 87%, much higher than the standard set by WHO, and case detection rate (*CDR*) of 56% because of DOTS.

This year and onwards, the government intends to further expand DOTS to the remainder of the country to achieve 100% coverage and

ensure that global targets will be achieved by 2005. It has also taken steps to strengthen the National Tuberculosis Program (*NTP*) by increasing the national budget for TB drugs and control activities. However, in spite of its commitment, the government failed to achieve the global target of a 70% CDR. Where is the missing link then?

The link lies in the integration of private physicians into the NTP. This is where the NTP has failed. Now, there is the pressing need to develop a Public – Private Mix (*PPM*) model for DOTS delivery to sustain what the DOTS program has achieved and ensure that global targets will be achieved by 2005.

B. Local and Foreign Studies

The 1997 National Prevalence Survey

There's very little data in the Philippines to show the TB caseload being managed in the private sector. Nevertheless, data from the 1997 National Prevalence Survey revealed that half of TB patients did nothing about their condition and 70% did not seek professional medical care. Of those who sought professional medical care, 30% to 60% consulted private physicians. Moreover, very few of these practitioners utilized the DOTS strategy as a tool for treating TB.

Even with the creation of the Philippine Coalition Against Tuberculosis (*PhilCAT*) in 1994, a coalition of private organizations and individuals committed to controlling TB in the country, a large segment of the private sector remains unorganized for TB control.

Diagnostic criteria vary among private physicians with chest radiography being favored over sputum examinations. Treatment regimens prescribed also differ widely and are often inadequate or inappropriate for cure. Private physicians have no ability to provide direct observation of treatment and rarely keep adequate records.

A Survey in Malabon, Metro Manila

A survey of 45 private physicians in Malabon, Metro Manila in 1999 and 2000 revealed that majority of them (95.6%) routinely used chest x-ray test for diagnosing TB. None of them prescribed the standard regimen for re-treatment cases. During follow-up examinations, chest x-ray test was also favored by the majority (95.6%).

The problem of poor compliance among TB patients was an acknowledged fact but almost a third (62.2%) never acted on the problem. Of those who took steps to keep track of their patients, all of them utilized unreliable ways of ensuring that patients came back and complied with the treatment. The more common ways of doing this included making telephone calls or telling relatives or neighbors to remind patients to go back to the clinics.

Perceived problems in TB control included:

- private physicians did not have enough time to supervise their patients (31.1%);
- insufficient drug supply in the health centers (66.7%);
- poor quality of anti-TB drugs from the health centers (17.8%).

Obstacles to public – private health sector collaboration have been identified:

- lack of anti-TB drugs in the health centers;
- lack of trust in the efficacy of anti-TB drugs from the health centers;
- poor case holding mechanisms of private physicians;
- poor record keeping of private physicians;
- loss of income and respect were feared by private physicians if referral to health center was frequent.

A Survey in the Amritsar District of Punjab State, India

In the case of Amritsar, 25 private physicians were interviewed in 2001 and the following results were drawn:

- respondents got a large number of fresh cases of pulmonary TB, with 36% of them diagnosed as many as five to 10 fresh cases per month;

- awareness of the NTP was low among them and only 12% asked for an AFB sputum smear exam of patients with cough lasting for three weeks or more;

- the public health system seemed to have consciously chosen to keep private physicians out of the purview of the NTP, since all respondents have never been contacted by an NTP manager regarding the program;

- there were evident problems in entrusting management of TB patients to private physicians since majority of them (80%) did not maintain any record of patients under treatment and all did not have any system to trace a defaulting patient.

In summary, the study indicated that private physicians were getting a significant number of fresh pulmonary TB cases but these were not being reported to the NTP. The opportunity for them to acquire information about the NTP hardly existed.

A Survey in Punjab State, India

There were 33 randomly selected health professionals in Punjab State, India who were interviewed in 2001. The interview aimed to gauge their level of awareness about DOTS and to gain insight about the process they follow while treating TB patients.

The following findings were obtained from the survey:

- a third (33%) of the respondents have not heard of the DOTS strategy as a treatment modality for TB;

- less than 10% knew the meaning of DOTS;

- less than half (42%) considered AFB sputum smear exam as the appropriate tool in TB diagnosis;

- less than a fourth (23%) considered AFB sputum smear exam as the best tool to monitor the progress of a TB patient under treatment.

II. Methodology

A. Settings

The surveys were conducted in five private health settings. These settings were chosen because of their strategic uses in the whole gamut of involving the private sector in TB control, as based on the DOTS framework.

These private health settings were:

- **Setting 1:** a private, tertiary hospital in an urban area (*Manila Doctors Hospital*)
- **Setting 2:** a first class province south of Metro Manila (*Cavite*)
- **Setting 3:** a private DOTS clinic in an urban area (*UNILAB DOTS Center*)
- **Setting 4:** selected industrial estates in a first class province south of Metro Manila (*Cavite Industrial Estates*)
- **Setting 5:** Health Maintenance Organization or an HMO setting (*Philamcare Clinics*)

B. Design

The surveys were descriptive and cross-sectional. A consolidation of all the data gathered from the surveys would provide baseline information about trends in TB management among private physicians in the Philippines. The objectives were to:

1. Describe the background characteristics of private physicians managing adult TB patients.

2. Provide information about private physicians' medical practices including variability in their TB treatment practices.

3. Determine the private physicians' awareness and utilization of the NTP and DOTS Strategy.

C. Population and Sampling

A total of 188 private physicians were interviewed using an interview schedule. The respondents were selected from various registries of medical societies or organizations through simple random sampling, as the case may be. The registries were screened and cross-checked with lists provided by different pharmaceutical companies, to include those private physicians treating adult TB patients only.

For Setting 1, the sampling frame used was the list of medical consultants in Manila Doctors Hospital; for Setting 2, the sampling frame used was the list of members of the Cavite Medical Society; for Setting 3, the sampling frame used was the list of private physicians licensed to practice in Pasig and Mandaluyong cities; for Setting 4, a sub-analysis of the sample in Setting 2 was made, limited only to private physicians engaged in Occupational Health practice; and for Setting 5, the sampling frame used was the list of medical consultants of Philamcare.

The distribution of respondents per setting is as follows:

Settings	No. of Respondents
Setting 1 – Manila Doctors Hospital	38
Setting 2 – Cavite	63
Setting 3 – UNILAB DOTS Center	64
Setting 4 (Sub-analysis of Setting 2)	*(31)*
Setting 5 – Philamcare	23
TOTAL	**188**

D. Method and Instrumentation

A standard interview schedule was developed (*in English*) to gather basic information as based on the objectives of the study. However, every model was allowed to modify it based on the needs and to pretest the same to determine

which questions were to be included, eliminated or restructured before these were to be asked of the respondents during the final interviews.

The interview schedule was constructed based mainly on the objectives of the study. It had three blocks.

The first block contained questions about the respondents' background characteristics while the second block consisted of questions regarding their private medical practices. The third block included questions concerning their knowledge and utilization of the NTP and DOTS Strategy.

III. Background characteristics of private physicians engaged in Tuberculosis care

A. Gender and Age Group

Majority (60.1%) of the respondents was male. Male to female ratio is placed at 1.5:1. Age range is from 26 to 82 years old, with mean age placed at 41.72 years. More than two-thirds (71.3%) belong to the more economically productive age groups (*35 years old and below, 36 to 40 years old and 41 to 45 years old*).

B. Educational and Training Background

Majority (76.7%) of the respondents graduated from private medical schools while less than a tenth (9.6%) finished medicine from a state university. Others did not identify what school they graduated from.

Majority (75%) completed a residency training program while very few (4%) had some sort of residency training but never completed it. A little more than a fifth (21%) never had any residency training at all.

In terms of specialization, a little more than a third (34%) were medical internists of which less than a fourth (23%) were pulmonologists. Other respondents specialized in Family Medicine, General Medicine, Pediatrics, Radiology, Surgery, Obstetrics and Gynecology, Family and Community Medicine, Anesthesiology and Otorhinolaryngology.

C. Type of Practice (*Allowed for multiple responses*)

A substantial number of private physicians were engaged in two or three types of medical practice.

More than half (59.6%) of the respondents engaged in private, hospital-based practice and almost half (46.3%) have private, freestanding clinics outside of a hospital. Almost a third (30.3%) was affiliated with HMOs and less than a fifth (14.9%) provided work for companies.

IV. Physicians' Private Practice

A. Practices in Diagnosing TB Suspects

Majority (95%) of the respondents used chest x-ray test as an initial diagnostic tool for TB. Reasons cited for its use included the following:

- most accessible to the physician
- easiest procedure in diagnosing TB
- used to complement clinical findings
- an annual PE requirement
- see other accompanying pulmonary diseases
- TB patient visiting a physician usually has a chest x-ray test done prior to the visit
- most affordable to the TB patient
- health center staff not competent in doing AFB sputum smear exams
- a standard procedure for private physicians

More than half (59%) also used AFB sputum smear exam in the initial diagnosis of TB. Reasons cited for its use included the following:

- TB bacilli are seen in the smears
- private physician follows the DOTS guidelines
- the gold standard in TB diagnosis
- cheapest exam in diagnosing TB
- determines the communicability of the TB patient
- TB patient cannot afford a chest x-ray test
- private physician has been trained to ask for an AFB sputum smear exam first
- AFB sputum smear exams are provided for free in health centers

However, In terms of frequency of use of AFB sputum smear exam, only 20% always (100% *of all TB suspects*) used it in diagnosing their TB patients. Half (50%) used it in varying frequencies, from seldom (less than 50% *of all TB suspects*) to sometimes (50% *of all TB suspects*) to often (more than 50% *of all TB suspects*). Still, very few (2%) never used AFB sputum smear exam in TB diagnosis. No more than 36% used PPD test as the initial diagnostic tool.

B. Practices in Treating TB Cases

In general, majority (84%) of the respondents never followed the standard treatment regimens for all types of TB cases. Very few (16%) followed standard treatment recommended by WHO.

For private physicians who encountered TB cases that required treatment regimen 1 (*2HRZE/4HR*), less than a fifth (16%) followed standard treatment. For those who provided treatment intervention to new smear (+) cases of TB, no more than 17 out of the 82 followed standard treatment. For those who gave treatment intervention to seriously ill TB patients, only 10 out of 72 followed standard treatment. For those who provided treatment intervention to TB patients who were smear (-) but with extensive parenchymal involvement on x-ray, only 9 out of 76

followed standard treatment. For extra pulmonary TB cases, only 10 out of 60 private physicians who gave treatment intervention followed standard treatment.

For private physicians who encountered TB cases that required treatment regimen 2 (*2HRZES/ 1HRZE/5HRE*), only a tenth (10%) followed standard treatment. For those who gave treatment intervention to failure cases, no one followed standard treatment. For those who provided treatment intervention to relapse cases, no more than 9 out of 55 followed standard treatment. For other cases of TB, only 7 out of 42 private physicians who gave treatment intervention followed standard treatment.

For private physicians who encountered patients who were smear (-) but with minimal PTB on x-ray, which required treatment regimen 3 (*2HRZ/4HR*), 24 out of 80 followed standard treatment.

C. Treatment Variants

It was found that the treatment provided by private physicians to TB patients were either inappropriate, inadequate or both. This brought into the fore the variations in treatment modalities that private physicians provided for every TB case.

The following treatment variants were discovered:

TB Case	No. of Treatment Variants (Aside from the standard)
Category 1	
New smear (+) case of TB	21 variants
Seriously Ill TB case	25 variants
Smear (-) but with extensive parenchymal involvement on x-ray	27 variants
EPTB	27 variants
Category 2	
Failure case	37 variants
Relapse case	27 variants
Smear (+) after five months of treatment	22 variants
Category 3	
Smear (-) but with minimal PTB on x-ray	21 variants
MDR TB case	17 variants

D. Recording and Monitoring Practices

Majority (95%) of the respondents maintained clinical records of their TB patients and the same percentage also monitored their TB patients' response to treatment. In terms of monitoring TB patients' response to treatment, close to two-thirds (61.7%) preferred chest x-ray test as the tool for monitoring treatment response. A little more than a third (38.3%) chose to monitor treatment response through symptom monitoring. This entailed a physical examination of the TB patient. Less than a third (28.7%), however, utilized the AFB sputum smear exam for monitoring treatment response.

With regard to monitoring TB patients' compliance to drug intake, majority (96%) declared that they do. However, the respondents depended on an unreliable method of monitoring compliance. Majority (66.5%) of them asked TB patients whether or not they have taken their medications. Very few (2%) utilized the services or help of barangay health workers (*BHWs*).

V. Awareness and utilization of the NTP and DOTS strategy

A. Awareness and Utilization of Laboratories that Offer Microscopy Tests

Less than two-thirds (61%) of the respondents were aware that there did exist laboratories near their clinics that offered AFB sputum smear exams to TB patients. The most commonly mentioned laboratory was the health center or rural health unit. Majority (73%) of them also referred their TB patients to these facilities to avail of laboratory services.

The most common reason for referring TB patients to these laboratories was economic. They mentioned that most of the patients they referred to these facilities could not afford to pay for AFB sputum smear exams in a private laboratory.

B. Awareness and Utilization of Health Facilities that Offer Free TB Drugs

Majority (94%) of the respondents was aware that there did exist health facilities near their clinics that offered free TB drugs to patients. The most commonly cited health facility was the health center or RHU. Majority (85%) of them also referred their TB patients to these facilities to avail of free drugs.

The main reason for referring TB patients to these facilities was economic. They verbalized that many of their patients could not afford to buy branded TB drugs for the entire duration of treatment.

C. Awareness and Utilization of the DOTS Strategy

Majority (73%) of the respondents was aware of the DOTS Strategy. However, less than a third (29%) utilized it in their private practice.

Various reasons were identified why private physicians did not utilize the DOTS Strategy and the more common of these were:

- private physician is not fully aware of the DOTS Strategy
- TB patients are not available/ do not have time to go to the clinic everyday
- private physician has no time to supervise the treatment or do DOT
- difficult to implement DOTS in private clinics
- private physician has no available staff to do DOT and monitor TB patients
- private physician has no access to free TB drugs to be given to patients

VI. Conclusions

The following conclusions were drawn based on the results of the surveys:

A. Private physicians underwent adequate training prior to their formal, independent practice. However, most of them have not undergone formal training on TB and the DOTS Strategy.

B. Private physicians are somehow engaged in at least two types of practice. Majority of them have engaged in private, hospital-based practice and have private, freestanding clinics outside the hospitals.

C. A chest x-ray test is more favored than an AFB sputum smear exam in the initial diagnosis of TB. Although a significant number of private physicians have used AFB sputum smear exam, the procedure is not constantly used in the diagnosis unlike the chest x-ray test.

D. Private physicians do not follow the standard treatment regimens recommended by WHO.

E. The treatment regimens prescribed by private physicians are so varied with some physicians prescribing wrong combination of drugs. This is even made worse by the incorrect duration of treatment they order their TB patients to follow.

F. Private physicians continue to favor a chest x-ray test even in monitoring TB patients' treatment responses. The AFB sputum smear exam is not a very popular choice in this case.

G. Private physicians depend on unreliable ways of monitoring TB patients' compliance to drug intake. Majority of them simply rely on asking patients whether or not they have taken their medications.

H. Private physicians are aware of existing health facilities that offer free drugs and laboratory services to TB patients. Majority of them claim to refer their TB patients to these facilities. However, most of those they refer are those who cannot afford to buy branded TB drugs.

I. Private physicians are aware of the DOTS Strategy but not many utilize it in managing their TB patients.

J. There is the need to inform and train private physicians about the NTP and DOTS Strategy.

VII. Recommendations

The following recommendations were formulated based on the findings of and conclusions drawn from the study.

A. Implement a massive information dissemination drive regarding TB, the NTP and DOTS Strategy through the tri-media targeting specific groups like TB patients and their families, private physicians, other health care professionals and the public in general.

B. Develop, reproduce and distribute information, education and communication (*IEC*) materials regarding TB for specific target groups like TB patients, their families and treatment partners, private physicians, other health care professionals and the public in general.

C. Develop and conduct DOTS training programs and seminars suited for private physicians in order to entice them in collaborating with the public health sector in controlling TB.

D. Advocate for the utilization of AFB sputum smear exam as the gold standard in TB diagnosis among private physicians.

E. Involve medical societies and other private and professional organizations in the NTP through a productive collaboration with the public health sector.

A SURVEY ON THE KNOWLEDGE, ATTITUDES AND PRACTICES REGARDING PTB AMONG PHYSICIANS AT MANILA DOCTORS HOSPITAL

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INTRODUCTION

Pulmonary Tuberculosis is perhaps the greatest health challenge to our time. Despite a proven low cost strategy, people continue to die. Fighting this disease will be a true test of our ability to come together as a global community. TB spreads through the air like a common cold. Most healthy bodies fight off the primary TB infection before any damage is done. However, substandard living conditions, such as malnutrition, crowding, poor air circulation and poor sanitation make the poor less healthy and provide a perfect breeding ground for tubercle bacilli. 90 % of TB deaths occur in developing countries *(1)*. TB infects someone every second and has in fact infected one third of the world's population. Between now and 2020, TB will newly infect nearly one billion more people of which 200 million will get sick and 70 million will die *(2)*.

TB is the 5th leading cause of death in the Philippines. About 100,000 new cases occur every year. Philippines ranks number seven of the 22 high burden countries globally and ranks number two reginally *(3)*. From the datas gathered by 1997 Philippine National Prevalence Survey, the estimated overall prevalence of tuberculous infection was 62.5 %, 66.7% males and 58.6% females. 11.2 per thousand or roughly 700,000 people have positive smear and culture *(4)*.

Despite availability of good and effective drugs for treatment of tuberculosis, PTB remains uncontrolled in the Philippines. The reasons are: inadequate case finding (both private and public sector), poor case holding (due especially to physicians and patients non adherence) and deficient health prevention programs *(5)*.

Evidence suggests that all sections of the population in poor countries seek care from private practitioners *(6)*. A large proportion of tuberculosis patients in high prevalence countries such as India, Pakistan, Philippines, Vietnam and Uganda first approach a private practitioner *(7)*. To ignore private practtitioners would be an omission on the part of National Tuberculosis programmes, particularly in places where a substantial proportion of tuberculosis patients visit private practioners whose management practices are suspect. Private practitioners offer major opportunities to improve tuberculosis control *(6)*. Since many patients first approach these

practitioners, there is an opportunity to reduce diagnostic delay, to reduce subsequent transmission and to improve treatment outcomes.

Therefore, the survey was conducted so that the knowledge, attitudes, practices of private physicians to PTB would be determined. With this, a possible brecommendation and conclusions could be given in order to strenghten TB control both from the public sector and private sector.

OBJECTIVES

GENERAL

To describe the knowledge, attitudes and practices towards tuberculosis among private practitioners at Manila Doctors Hospital.

SPECIFIC

1) To describe the socio demographic profile of the physician respondents.
2) To determine the average patient load and TB cases of each physician.
3) To determine the knowledge, attitudes and practices of private physicians at Manila Doctors Hospital as to
   a. diagnosis of pulmonary TB
      - initial diagnostic tool
      - use of sputum AFB smear
      - use of guidelines
   b. treatment
      - drugs
      - use of guidelines
   c. monitoring of patients
      - maintenance of clinic records
      - follow – up
   d. monitoring patient's compliance

e. outcome

4) To determine the awareness of private physicians regarding free health fascilities for PTB

5) To determine the awareness of private physicians to DOTS (Directly Observed Treatment Short Course).

SCOPE AND LIMITATION

The possibility of non response to the questionnaires in a survey should be considered thus the questionnaire was made as simple as possible. Most of the questions are qualitative, enabling the respondents to check the answers.

MATERIALS AND METHODS

The study was done at Manila Doctors Hospital where private practitioners (active and courtesy staff) were chosen. It is a cross sectional survey. The survey was conducted for a period of two weeks.

From among the list of private practioners at MDH, respondents were chosen. Sampling was done by stratified random selection. The sample size was 41, according to specialty, it was grouped as Internal Medicine, general practitioners, surgery, pediatrics, OB GYN etc.

A structured questionnaire was used in data collection. The respondents were asked about demographic characteristics; practices in diagnosis, treatment, monitoring, outcome ; knowledge about TB fascilities and knowledge about DOTS. Majority of physicians were interviewed. Frequencies were determined for the responses to all questions.

RESULTS

Sixty questionnaires were distributed, of these , forty one were returned fully accomplished.

Demographic Characteristics

The mean age of respondents was 41-42 years old , the youngest being 30 years old and the oldest being 73 years old. *(Table 1)*

There were more males (70.73 %) than females (29.26 %). 90.12 % of respondents finished residency, 4.88 % did not. Majority of the respondents were internists (60.98%), the rest are OB GYN (4.8%), family medicine (9.7%), general practitioners (4.8%), pediatrics (7.32%), surgery (9.75%) and anesthesia (2.44%). Most of the internists have subspecialties predominantly cardiology (36%) and pulmonology (20%). *(Table 1)*

Majority of respondents are into private hospital based practice (82.93%). Aside from private hospital based practice, some are also into private free standing clinic (17.07%), HMO Based (17.07%) and government hospital based (14.63%). *(Fig. 1)* 75.61 % of the physicians don't teach in medical school, while 24.39% are actively teaching in one or more medical school. *(Fig 2)*

Patient Load

The average number of patients seen by physicians is 50 patients per week. Among these patients, 7-8 are diagnosed to have PTB or with concomittant PTB.

Practices in Diagnosis

All respondents utilize chest x ray as initial diagnostic tool when PTB is suspected. The following are also requested: sputum AFB smear (80.49%), PPD (41.46%), sputum culture (31.71%), ESR (2.44%). *(Fig 8)*

With regards to the use of sputum AFB smear as a routine diagnostic work up, only 14.63% of the respondents request it to 100% of their patients. 85.36 % answered less than 100%: 9.7% never request it, 34.14 % request it to only less than 50% and 41.46 % request it to more than 50 % of their patients. *(Fig 3)* For those who did not answer 100%, their reasons were as follows: 1. Chest x ray is enough basis (42.86%) 2. Don't rely on it for diagnosis (8.57%) 3. No known reliable laboratory (2.86%) 4. Expensive (2.86%) 5. Incovenient for patients (5.71%) 6. No sputum (20%) 7. Low yield (5.71%) 8. They refer to MDs (2.86%) 9. No reason (81.57%) *(Fig 4)* 51.22% of these physicians base their diagnosis on a guideline. Majority of them use Philippine TB consensus (38.09%) and Philcat (19.05%) *(Fig 5 and 6)*

Practices on Treatment

The three most commonly used drugs are Isoniazid (92.6%), Rifampicin (92.6%) and Pyrazinamide (90.24%). These are followed by Ethambutol (87.80%) and Sterptomycin (4.88%) *(Fig 7)*. Majority of the respondents practice the 6 month regimen (85.36%), 60.98% of these physicians prescribe Pyrazinamide for 2 months. 7.32% don't manage and treat PTB patients. 53.66% follow a guideline in treating TB patients, 41.46% don't follow a guideline, 4.88% don't manage or treat TB patients*(Fig 9)*. Most of those who follow the guidelines make use of Phil TB consensus (27.7%), Philcat (18.18%). 18.18% cannot recall the guideline. *(Fig 10)*

Practices in Monitoring

82.92% maintain clinic records of their patients with PTB, 7.32% don't maintain clinic records, 9.76% don't manage or treat PTB patients. *(Fig 11)*

Most of the physicians do their first follow up after 1 month (41.46%), other after two months (26.83%), rarely after 1 week (17.07%), and after 2 weeks (4.88%). *(Fig 12)*

Respondents usually schedule patients follow up monthly (48.78%), every 2 months (29.27%) and every 4 months (7.32%). 9.76% don't manage and treat PTB. *(Fig 13)*

During follow up visits, physicians monitor their patients by history and PE (82.93%). Chest x ray (63.42%), sputum exam (29.27%) and culture (4.88%). 9.76% don't manage and treat PTB. *(Fig 14)*

If patients don't respond to initial treatment, majority of the physicians refer to another MD (43.90%), some would change regimen (41.46%), others will repeat sputum (4.88%), 9.76% don't manage or treat PTB. *(Fig 15)*

Practices on Monitoring Patients compliance

75.61% monitor patients compliance, 14.63% do not. 9.76% don't manage and treat PTB. Out of the 75 % who monitor, 86.87% rely on patients monitoring, 9.68% rely on Blister packs, 6.45% rely on monitoring patient. *(Fig 16 and 17)*

Outcome Parameters

When asked about what is the percentage of patients who complete 6 months of treatment, 26.83% say its between 71-80%; 24.39% say they cannot determine; 19.51% say its between 81-99% ; 12.20% say its between 51-60 %; 7.32% say its 100%. *(Table 2)*

Regarding percentage of patients with follow up at the end of 6 months, 21.96% of the respondents say that 51-60% of these patients follow up; 17.07% say that 71-80% of patients follow up; 21.95% say that they cannot determine. *(Table 3)*

75.61% do not request sputum smear at the end of 6 months. This is because they rely on chest x ray (45.16%), clinical response (38.71%), some patients do not produce sputum (16.13%). *(Fig 18 and 19)*

Awareness of free health fascilities for PTB

58.54% of the respondents are aware of existing free health fascilities for PTB. 91.67% of this answered government health centers. However, majority of them do not refer their patients these clinics (51.22%). *(Fig. 20-22)*

75.61% of the respondents are not aware of microscopy centers that offer free sputum smear examinations to PTB suspects. *(Fig 23)*

Awareness of DOTS

51.22% of the physicians never heard of DOTS (Directly Observed Treatment Short Course). 90.24% of the respondents do not utilize DOTS. *(Fig.24 and 25)*

DISCUSSION

Tuberculosis remains a major health problem in our country. Philippines ranks second to Cambodia in terms of new smear positive TB notification rate, 99.7 per 100,000 population among the major countries in WHO Western Pacific Region in 1999 (9). Tuberculosis has been declared a global emergency by WHO *(10)*. Adverse social and economic factors and patients non adherence in the following prescribed treatment regimens are contributing factors to the increase of TB patients.

The Manual of Procedures (MOP) for the National Tuberculosis Control Program was released in year 2001, this manual was based on WHO general health service revised so that it would be consistent with current health situation in the Philippines. Its use is not only for training but also as instruction guides in the daily practice of all health workers. The mission of NTP is to ensure that TB diagnostic, treatment and information services are available and accesible to the community. Its goal is that morbidity and mortality from TB are reduced to half in 10 years (by the year 2010). This could be accomplished by addressing the specific problems like poor case finding, inefficient case holding, lack of complete monitoring and evaluation leading to poor compliance. Several strategies have been formed and implemented by National TB program however many TB control advocates think that the DOH is doomed to fail unless public health efforts are integrated with that of private sector. Considering the following health policy issues: **1.** Around 50% of TB patients are managed in private clinics/hospitals by private physicians **2.** Diagnosis of PTB in private clinics/hospital are still based on clinical data and CXR, instead of sputum microscopy. **3.** Treatment is individualized, non-uniform and not following the guidelines set by WHO and/or National TB program **4.** Treatment recording, reporting and monitoring is poor and non uniform *(2)*. Private practitioners play a major role in promoting campaign to decrease incidence of PTB in the Philippines. This is why this survey

was made to be able to document the different practices of physicians in MDH with regards to diagnosis, monitoring and treating TB patients.

Diagnosis and Case finding

One of the stated problems earlier was non uniform basis for diagnosis mainly from clinical data and chest x ray rather than sputum AFB. This was reflected by a 100% priority for chest x ray. Not all physicians do sputum AFB to all their patients, reasons were stated. However the NTP guideline *(see Annex A and B)* recommends that the principal diagnostic method is direct sputum smear examination. This is primary in case finding *(9)*. Many would say that the sputum AFB smear is not reliable and results are low yield. But with proper collection of sputum, false negatives will be prevented, along with the improvement of the quality of sputum smear examinations at microscopy centers. This could be achived by training medical technicians and microscopists, laboratory network and establishment of quality assurance system for field microscopy.

With the use of more chest x ray than sputum AFB smear, overdiagnosis (false positive) of PTB is possible and common in routine clinical practice *(10)*. Based on x ray exam and clinical symptoms, only a presumptive diagnosis can be made *(11)*.

Almost half of the physicians don't follow a guideline. This would also account for the non uniform practices in diagnosis and case finding.

Treatment

According to the National Tuberculosis Program short course regimens (6 months) with 2 months intensive phase and 4 months maintenance phase will be practiced. Intensive phase would include 4 drugs, maintenance phase would include 2 drugs. This would be applicable to newly, uncomplicated PTB. The drugs recommended are Isoniazid, Rifampicin, Pyrazinamide, Ethambutol and Streptomycin (10). Internationally, the duration of treatment for smear negative minimal TB case is 9 months. WHO has changed its recommendation of the treatment for such a case; has deleted the 4 months regimen from recommended since 1997 because of insufficient proof showing its efficiency. *(14)*

In this respect, majority of the private physicians follow the recommendations. Some would give it more than 6 months (8 months to 1 year). None of them give the drugs in less than 6 months. Majority use the quadruple therapy (Isoniazid, Rifampicin, Pyrazinamide and Ethambutol). Despite the fact that many of them don't use guidelines in treating PTB, most of them adhere to the recommendations. *(see Annex C)*

Monitoring/ Compliance and DOTS

While effective anti TB drugs are available in the country, there are still many TB patients not cured. This is due to the fact that many patients stop taking or irregularly take their drugs. Monitoring patient and treatment compliance is necessary to cure TB and avoid drug resistance *(12)*. The best way to prevent the occurrence of drug resistance is through regular intake of drugs for the prescribed durations. The strategy developed to ensure treatment compliance is called Directly Observed Treatment Short Course (DOTS) *(10)*. DOTS is a TB programme in which patients receive 6 to 8 months of treatment under the supervision of trained health worker *(1)*.

In the study, majority of the physicians maintain clinic records and this is essential in monitoring follow up and compliance of patients. As recommended, physicians should follow up patients progress periodically. Most of the physicians do the initial follow up after 1 month then every month subsequently.

The respondents commonly use history, PE and chest x ray as parameters in following up patients. However, NTP recommends that to monitor the response to treatment, follow up sputum examinations should be done towards the end of 2^{nd} month, 4^{th} month and on the beginning of 6^{th} month *(10)*. The recommended schedule stated is for category 1 case *(see Annex D)* The revised definitions of cure for new smear positive case definitely requires the smear negative result in the last month of treatment *(13)*. Chest x ray would be next in priority. However, only 29% of the physicians use sputum exam for monitoring. If patient does not respond to initial treatment, they either change regimen or refer to another doctor.

Monitoring patients adherence and compliance is necessary for a succesful treatment. Majority of physicians monitor patients compliance by merely depending on patients reporting which could be inaccurate. This is why DOTS is essential, as recommended by NTP (both for intensive and maintenance phase) DOTS is helpful because 1. Many TB patients quit taking medicines not only during the intensive phase but also during the maintenance phase 2. It will prevent difficulties through strict supervision during the whole course of treatment 3. to prevent having drug resistant TB againts Rifampicin *(13)*. According to the Global Tuberculosis Control, a study was conducted in the Philippines regarding treatment under DOTS, it showed that there is 87% treatment success rate. In the study done by WHO, there is less than 20 % fatality rate in patients receiving DOTS as compared to more than 30 % in non DOTS.

In this study, it was noted that, more than 50 % of private practitioners are not aware of DOTS. 90 % of these doctors are not utilizing DOTS. This is one of the reasons why treatment outcome is variable. The target of NTP which are **1.** Cure at least 85 % of sputum smear positive TB patients. **2.** Detect at least 70 % of estimated new sputum smear positive TB cases, will be difficult to achieve without the help of DOTS.

Treatment Outcomes

The study showed that most of the physicians achieve complete treatment (6 months) in 50-70% of their patients, approximately 20 % of the respondents cannot determine treatment outcomes of their patients.

A TB patient who undergoes treatment may achieve any of the following outcomes:

1. Cure – A sputum smear positive patient who has been completed treatment and is sputum smear negative in the last month of treatment and on at least one previous occasion.
2. Treatment Completed - A patient who has completed treatment but does not meet the criteria to be classified as cure or failure
3. Treatment Failure – A patient who is sputum smear positive at 5 months or later during the treatment.

4. Died – A patient who dies for any reason during the course of treatment.
5. Defaulter – A patient whose treatment was interrupted for two consecutive months or more
6. Transfer out – A patient who has been transferred to another facility with proper referral for continuation of treatment.

75 % of the physicians do not request sputum smear at the end of 6 months as opposed to the NTP recommendation which is also consistent with WHO's definitions of case and treatment outcomes. With this, proper qualifications of patients will be difficult. Cure rate will not be documented since a sputum smear is essentail in the determination of outcomes.

CONCLUSION

In summary, this study showed that most common type of practice is private, hospital based clinic. Majority of the respondents are specialists and do not teach in a Medical School.The average number of TB cases they see is between 7 – 8 patients per week.

In case finding, chest x ray is the most common and most prioritized initial diagnostic test requested in patients who are suspected to have PTB. 85 % of the respondents do not always request sputum AFB smear. Only 50 % of the respondents base their diagnosis on a guideline.

In treating patients, majority of the respondents adhere to the NTP recommendation, which is, 6 months regimen involving at least 3 anti TB drugs. 50% of the respondents follow a guideline in treating PTB.

82% of the respondents maintain clinic records of their patients with monthly follow up History, physical examination, and chest x ray still remain as the widely used parameters in monitoring treatment response of PTB patients.

Respondents rely on patient reporting when monitoring patient's compliance. Between 50 – 70% of the patients complete the 6 month regimen for PTB. 75 % of the respondents do not request sputum AFB smear at the end of 6 months.

Regarding the awareness of private physicians in TB fascilities, 50 % 0f the respondents are aware of free health clinics for PTB, however, 51% of them do not refer patients to these clinics.Only 46 % of the respondents are aware of Directly Observed Treatment Short Course (DOTS). 90% of the physicians do not utilize DOTS.

RECOMMENDATIONS

1) Information dissemination of the proposed guideline both for the physicians and the patients.
2) A study involving feasibility of DOTS in a private, hospital setting.
3) Proper education and training of health workers to ensure uniformity of management of PTB.

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COMMUNITY PROFILE OF PASIG AND MANDALUYONG AND SURVEY OF THE KNOWLEDGE, ATTITUDES AND PRACTICES OF PRIVATE PHYSICIANS

Private DOTS Unit Model: CDC Project

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COMMUNITY PROFILE OF PASIG AND MANDALUYONG AND SURVEY OF THE KNOWLEDGE, ATTITUDES AND PRACTICES OF PRIVATE PHYSICIANS

Abstract

Objective: To investigate the Knowledge, attitudes and practices towards the treatment of Pulmonary tuberculosis among private medical practices in the Pasig Mandaluyong area.

Design: A standard questionnaire was first formulated and pretested. Doctor's offices/ clinics were then identified using the listing of the pharmaceutical firm United Laboratories. Out of the 100 doctors targeted, 85 doctors were chosen using cluster sampling. Of these, 7 doctors refused, 14 respondents don't see/treat pulmonary tuberculosis and only 68 doctors had full interviews. The investigator did a face to face interview.

Results: The mean age of the respondents was 42 years old. There were more males than females. Most had their residency training. The predominant type of practice was private. Chest x-ray is the initial diagnostic work up employed by most physicians, this was followed by PPD testing. Though the respondents request sputum AFB, it is often only used as an adjunct diagnostic tool. Only a quarter of the respondents use the standard regimen for newly diagnosed PTB cases. None use the standard regimen for previously treated PTB cases. None of the respondents keep a separate record for their PTB patients. Though most doctors tell their patients to follow-up regularly, majority ask their patients to follow-up monthly. They monitor their patients compliance to anti TB drug intake mostly by their

honesty basis or by patients word. Majority of doctors monitor treatment outcomes by chest x-ray. While most doctors are aware of the DOTS program of the WHO/DOH, a great majority (95%) do not utilize it for the treatment of their PTB patients.

Conclusion: Even with the guidelines published by the WHO/DOH on the diagnosis, treatment, monitoring, recording and follow-up of patients with tuberculosis, respondents in the study still go about their own way in their approach and management of TB patients.

COMMUNITY PROFILE OF PASIG AND MANDALUYONG AND SURVEY OF THE KNOWLEDGE, ATTITUDES AND PRACTICES OF PRIVATE PHYSICIANS

Introduction

Tuberculosis (TB) remains one of the deadliest diseases in the world. The World Health Organization (WHO) estimates that each year, more than 8 million persons die from the disease[1]. Ninety five percent of tuberculosis cases occur in the developing world[2]. In the Philippines, TB ranks 5th amongst the leading causes of morbidity and mortality in the country[3]. The 1997 National Prevalence Survey showed that there are around 500,000 cases of bacillary tuberculosis nationwide[4].

Directly Observed Therapy – Short-course (DOTS), the TB control strategy of the WHO is hailed as one of the most cost-effective interventions in human health[4]. It has been adapted by 119 countries worldwide[5], the Philippines included. The administration of standardized short-course chemotherapy (SCC) regimens with the first-line drugs Isoniazid (H), Rifampicin (R), Pyrazinamide (Z), Ethambutol (E) and Streptomycin (S) is only one of the components of the DOTS strategy. DOTS is actually a system using a standard approach to diagnosis, treatment, recording, reporting and an access to an uninterrupted supply of anti-TB drugs. The National TB Control Service of the Department of Health (DOH) utilized this as its most important and most effective strategy in addressing the TB problem of the country.

In the late 1990's, the TB Council of Philippine College of Chest Physicians (PCCP), with the Philippine Society for Microbiology and Infectious Diseases (PSMID) and the DOH developed the Philippine Practice Guidelines on the Diagnosis, Treatment and Control of Pulmonary Tuberculosis (National Consensus on Tuberculosis). However, despite this joint effort from the medical societies and the government, the task of reaching the private sector seems too huge. Some private physicians will likely persist to have their own ideas and concepts in approaching TB for a large proportion of them treat TB patients according to myths and biases picked up during medical school days and during their practice. This is unfortunate because majority of TB patients who seek health care because of TB symptoms go to private physicians. This was shown by the 1997 prevalence study showing 46% of the 592 individuals with TB like symptoms consulted private physicians as against 30% who consulted government health centers [7]. Indeed the private sector has a huge role to play in the control of TB.

DOTS has expanded extensively countrywide, reaching almost 100% of our health centers. However, despite this aggressiveness from the government, if the private sector will continue to manage TB the traditional way, that is, by merely handing prescriptions to patients, then, the majority of TB cases will not be managed in a cost-effective manner. Because of patient non-adherence to prescriptions, drug-resistance will proliferate threatening the success of DOTS. Indeed, the responsibility of TB control should be assumed by both the government and the private sector though private-public collaboration.

Setting

The Unilab DOTS Center is a private initiated DOTS model located at the boundary point between Pasig and Mandaluyong. It is a private clinic that offers diagnosis, treatment supervision and monitoring of TB patients. It has been in existence since October 1999 and has enrolled 155 patients in its DOTS program. Sources of referrals come from the private sector in 65% of cases. Recently, it entered into a collaboration with the DOH through a Memorandum of Agreement.

Objectives

General:

To obtain basic community profiles of Pasig and Mandaluyong Cities, the adjacent cities of the private(-public) DOTS model and to describe the knowledge, attitudes and practices of private doctors in these areas.

Specific:

1. To know the available health facilities such as government and private health clinics and hospitals in Pasig and Mandaluyong and their locations in relation to the DOTS Center
2. To know the available sputum microscopy centers in Pasig and Mandaluyong
3. To obtain a map of both cities with the health facilities and microscopy centers indicated in relation to the DOTS Center
4. To know the approximate number of private practicing physicians in Pasig and Mandaluyong
5. To have a background of these private physicians, e.g., demographics, level of training (residency and subspecialty) and areas and type of practice, whether purely private or public and private combined

6. To determine the practices of the private physicians in the: a) diagnosis of PTB (initial diagnostic tool, other diagnostic tools used, use of sputum acid-fast bacilli (AFB) smear, b) treatment for new and for retreatment cases, c) recording (maintaining separate record for PTB patients, case reporting), d) monitoring compliance (follow-up, ways of monitoring compliance), e) monitoring treatment outcomes (percentage of PTB patients who complete anti-TB treatment, use of sputum AFB smear and other tests to monitor treatment response
7. To determine the knowledge and awareness of private physicians on a) the free health facilities and services for PTB, and on b) the DOTS strategy
8. To determine the attitudes of private physicians towards the utilization of a) the health services offered by the public sector, and b) the DOTS strategy

MATERIALS AND METHOD

I. Survey of Community Profile:

Visits to both the Pasig City and Mandaluyong City Halls were made. From each, a map of the whole city was obtained and the boundaries of the different barangays delineated. Information on population size and location of the urban poor areas where obtained from the Assessor's office in Pasig City, and from the Planning and Development Office in Mandaluyong City.

A list of health facilities including health centers, government hospitals, microscopy centers, and their respective officers-in-charge and contact numbers were obtained from each City Health Offices. From the DOH-National Capital Region (NCR), a list of private and government health facilities including hospitals

and laboratories was obtained with their respective health officers-in-charge and contact numbers.

All the pertinent information gathered were then collated in a color-coded map of the respective cities indicating sites of health facilities (hospitals health clinics, microscopy units and laboratories that perform microscopy) specified as to government and private.

II. Survey of private physicians

A general registry of private practicing physicians in Pasig and Mandaluyong was obtained from the United Laboratories database. A total of 932 doctors were listed together with their areas of practice, including 308 from Pasig City and 624 from Mandaluyong City. From the list, areas with high concentrations of practicing physicians were identified as clusters. Considering these clusters, random sampling of 100 doctors was done using a table of random numbers. The randomly selected doctors were visited in their respective areas of practice. They were interviewed personally by one research associate using a standard questionnaire. (Annex 1). The questionnaire consisted of queries on demographics, specialization, types of practice whether purely private, or a mixture of private and government, number of patients seen and whether they see PTB patients or not, practices on TB diagnostics, therapeutics and monitoring, and awareness on free health services and the DOTS strategy and their attitudes to these. Responses were coded directly into datasheets by the interviewee himself. Entries were edited by the Project Leader and encoded into the computer and analyzed using the SPSS program.

Population

Inclusion and Exclusion Criteria

Included in this study were physicians who maintained private clinics in Pasig or Mandaluyong, regardless of specialty or type of practice.

Excluded from the survey were physicians under a training program, whether residency or fellowship, consultant physicians with no out-patient clinic and physicians who refused to be interviewed.

For the analysis, physicians who did not see TB patients in their practice at all were not included.

Results:

Survey of health and laboratory facilities

Hospitals

There were ten hospitals in Pasig City, two of which, Rizal Medical Center and Pasig City General Hospital were government and considered training hospitals. The rest were small non-training private hospitals with no resident physicians. In Mandaluyong City, there were five hospitals, four of which, Mandaluyong Medical Center, the National Center for Mental Health, Victor Potenciano Memorial Medical Center (VPMMC) formerly Polymedic Hospital and The Medical City General Hospital (TMCGH), were training hospitals. Mandaluyong Medical Center and the National Center for Mental Health were government while VPMMC, Unciano General Hospital and TMCGH were private.

Health Centers and Government Microscopy Units

Annex 2A lists the government Health Centers in Pasig City where there were 39, with 10 of these functioning as Microscopy Centers. The corresponding addresses, health physicians-in-charge, nurse or midwife and contact numbers are tabulated.

Annex 2B lists the Health Centers in Mandaluyong City where there were 23, with 6 of these functioning as Microscopy Centers. The corresponding addresses, health physicians-in-charge, nurse or midwife and contact numbers are likewise shown.

Private Microscopy Units

Annex 3 lists the private laboratories which claimed to perform sputum microscopy or AFB smear in both Pasig and Mandaluyong Cities, where there were eight and six, respectively. The corresponding addresses and contact numbers are listed.

City Maps

Annex 4A (available as hard copy) is a map of Pasig City with the health facilities and microscopy facilities are indicated. Annex 4B is a map of Mandaluyong City with color-coded indications of the health and laboratory facilities.

Survey on private physicians in Pasig and Mandaluyong

Selection of subjects

Of the 308 physicians in the Pasig area, 108 were excluded; and of the 624 physicians in Mandaluyong, 350 were excluded. There were then 474 eligible doctors with varying specialties and types of practice. Most of these doctors were concentrated in certain areas in Pasig and Mandaluyong from which the selection was done. These areas included a) the Medico Building and b) the Medical Plaza considered as the Medical Arts buildings of TMCGH, c) the Medical Arts building of VPMMC, d) Clinica Manila, an out-patient clinic in Shoemart Megamall, e) Health First Clinic, and f) Friendly Care Clinic.

Of the targeted 100 doctors, 85 were visited of whom seven refused to be interviewed. Of the remaining 78, 14 do not see PTB patients in their practice, while the remaining 64 had full interviews and will thus be included in the data analysis.

Demographic characteristics, specialization and type of practice

Of the 64 respondent physicians, there were more males than females (64% vs. 36%) (Figure 1). The mean age of respondents was 43 years old, age ranging from 30 to 82 years (Figure 2). Majority of respondents had residency training (95%). Majority of respondents were internists (48%), the rest were pediatricians (25%), family physicians (9%), surgeons (10%), OBGYN (3%), ENT specialists (2%) and general practitioners (3%) (Figure 4). Most internists had subspecialties (94%) (Figure 5).

Majority of the respondents are into pure private practice (78%), whereas the remaining 22% are engaged in mixed private and government practice classified in this report under "government" category (Figure 6).

Current practice

Current practice in diagnosis

Majority of respondents (91%) used chest radiography as the initial diagnostic tool for TB symptomatics while 9% used PPD, and none utilized sputum microscopy (Figure 7). However, when asked as to what other diagnostic tools are used, 89% used sputum microscopy either alone or together with other diagnostic tools, which consisted of the pathozyme test (1.6%), chest x-ray (CXR) (3.1%), PPD (45%) (Figure 8). Of those who used sputum AFB as a diagnostic tool, almost half 49% used it in more than 50% of their patients; the rest used it in less than 50% of their patients. Those who never requested sputum AFB smear for diagnosis cited the following reasons for such practice: a) it is not appropriate for pediatric patients (53%), b) chest x-ray is enough basis (20%), c) patients do not produce adequate sputum (13%) d) it is inconvenient to patients (7%), and e) they do not know of any reliable sputum microscopy laboratory.

Current practice in treatment

For newly diagnosed cases of PTB most respondents (64%) prescribed quadruple anti-TB regimen consisting of H, R, Z and E; others (36%) used triple drug therapy using H, R and Z or H, R and E (Figure 9). Only a total of 34% of the respondents were using the standard regimen and duration for new cases as recommended by the DOTS strategy, namely 2 months of HRZE/ 4 HR (Regimen I, DOH) and 2HRZ/4HR (Regimen 3, DOH). Other regimens used for new cases are listed in Table 1.

For previously treated patients, the respondents used different treatment regimens (Figure 10). None used the DOTS standard regimen of 2HRZES/1HRZE/5HRE. Table 2 lists the various regimens used for previously treated patients.

If patients failed symptomatically on the drugs prescribed, most respondents said they will refer to a specialist (55%); others will change the treatment regimen (28%), while 5% of the respondents will take no action (Figure 11). Others consisting of 12% will request for sputum AFB culture and sensitivity, check for correctness of dosage, and check for exposure to drug-resistance, and use tablets for pediatric patients (Figure 12).

For those who will change the treatment regimen in their failing patients, 22% will add a combination of a quinolone and amikacin, another 22% will use streptomycin and a quinolone, 11% will use morphazinamide, isobutol, terivalidine, clarithromycin and rifampicin, 6% will add a quinolone alone, 6% will add gamma globulin, another 6% will await sensitivity results and revise accordingly, and another 6% will just extend the currently taken regimen.

Current practices in recording

Majority of respondents (97%) did not maintain a separate record of their PTB patients (Figure 13). Most (93%) did not report PTB cases to any government

authority or any DOH office. The reasons cited for such practice were: a) they are not required (74%), b) they have no time to report (10%), c) they have no access to government agencies (3%), .There was no particular reasoning 13% of the respondents.

Current practice in monitoring compliance

In 97% of respondents, regular follow-up for PTB patients was done (Figure 14), majority of whom (77%) asked patients to follow-up in the clinic every month. If patients failed to follow up as instructed, majority of respondents (56%) did not keep track of their patients, and only 44% reminded patients by phone of their follow-up (Figure 15).

As to monitoring in terms of their compliance to anti-TB drug intake, 95% checked on their patients. They did this by a) relying on the patient's/relative's own word (77%), b) checking the blister packs and relying on the patient's/ relative's own word (16%), c) checking the blister packs alone (5%). Figure 16.

Current in practice in monitoring treatment outcome

Almost all (98%) physicians monitored their patients' treatment outcomes (Figure 17). When asked what percentage of their PTB patients completed anti-TB treatment, 78% answered more than 50% did complete treatment under their care; 14% answered less than 50% of patients completed treatment, and 8% answered 100% completed treatment.

Tools and parameters used to monitor treatment outcomes were will chest x-ray alone in 64%, CXR and sputum AFB in 24%, clinical signs and symptoms and the patients' weight in 9%, CXR, sputum AFB and culture and sensitivity in 3% (Figure 18).

Awareness and attitudes

Awareness of free health and laboratory services

Of the respondents, 92% of were aware that there are health facilities offering free or subsidized anti-TB drugs (Figure 19), 95% of whom were willing to refer their TB patients to such health facilities (Figure 20). The remaining 5% who were not willing to not refer to these facilities cited the following reasons: a) facilities are not manned by doctors, and b) their patients are private, paying patients.

When asked if they know of any health facilities that offer free sputum AFB examination to patients, 52% answered yes, while 48% answered no (Figure 21). Those who answered yes were asked if they were willing to refer their patients to these microscopy centers, and 90% answered yes; only 10% answered no, with the question of the centers' proficiency to perform microscopy being raised.

Awareness of the DOTS strategy

Among the respondents, 62% were aware of the DOTS strategy and have some knowledge on what it is (Figure 22). When asked if they were willing to refer to a DOTS Center, 95% answered no (Figure 23). Asked why, they cited the following reasons: a) their patients are motivated enough to take the anti-TB drugs on their

own, b) there is no existing set-up for DOTS, c) DOTS is not yet fully implemented, d) DOTS is difficult and impractical to implement, e) respondents did not know how to implement it, f) they did not have enough manpower to do it, g) taking medicines is the patient's own responsibility, h) DOTS is not for pediatric patients, i) patients would not want it, and j) it is simply not possible.

Discussion:

DOTS as envisioned and espoused by the World Health Organization (WHO) is actually a comprehensive system which is concerned not only with the direct observation of intake of anti-TB medicines but also with the monitoring of treatment of response and the completion of treatment. This is possible through its five elements, all of which have to be incorporated in the system. Sputum microscopy as the primary means of diagnosis in DOTS appears to lack acceptability in this population of private physicians, although it is used by almost 90% respondents as an adjunctive procedure. This is not a surprising response among private practitioners who have been accustomed to using radiography as the only tool. The high specificity of sputum microscopy as a diagnostic tool needs to be emphasized, as well as the fact that it is simple and easy to perform, is cost-effective and can be made available easily in remote areas as compared to chest x-ray.

Responses why sputum microscopy is not performed needs to be taken seriously and addressed. Reliability and proficiency of our microscopy centers should be evaluated and centers have to be subjected to monitoring from time to time. There is a great need to prove to the private sector that microscopy centers in the

health clinics are manned by trained microscopists whom they can trust for their patients' diagnosis.

Administering the correct regimens to anti-TB patients is an important element of DOTS. This study shows the need for dissemination of the DOTS standard regimens for new and retreatment cases. There were 14 different combinations of first-line drugs for new cases and 20 for retreatment cases. Only a third of physicians used the standard regimen for new cases in the proper way. Its is unfortunate that some still believe that new cases need 9-12 months of treatment.

Failures are managed in several ways by private physicians. One of the actins taken in failure is adding a quinolone to the failing regimen. This action is completely objectionable as it will likely put the quinolone to waste by amplifying the resistance. There should be a campaign against the free use of the available fluoroquinolones for failures in TB because the drug is fast losing its effectiveness because of resistance. Indeed, in a study by Grimaldo, Tupasi et al, the rate of quinolone resistance among TB isolates had increased significantly over a period of about 10 years.[8]

The level of awareness of the private sector on the availablility of free health services for TB is quite high as well as the willingness to refer to these centers. Awareness on the DOTS strategy was not as high; only 62% claimed to know DOTS. There is a need to disseminate the DOTS strategy to the private sector and emphasize its strong impact on TB control. Again, the attitude of unwillingness to refer to a DOTS Center was striking. The reasons cited are valid and needs to be addressed. While the infrastructure for the DOTS strategy in the country is mainly in public sector, efforts should be made to upgrade the standards of these health centers in order that the private sector will be enticed to refer their patients to

DOTS. While expansion of DOTS to all areas in the Philippines makes DOTS accessible to all patients and physicians, these centers need upgrading and constant monitoring and reevaluation so as to keep standards of performance high enough for the private sector to accept and utilize. Simultaneously, efforts should also be directed at creating public-private partnerships in TB with the goal of setting up DOTS models that may be more enticing to the private sector.

Conclusion

While both upgrading the government centers and working on private-public links are essential, education or information dissemination should also be given high priority. The private sector needs to know the magnitude of the TB problem in the country – that in a 14-year period from the first nationwide TB prevalence survey in 1981-1983 to the second in 1997, there has been very minimal decline in the status of TB in the country.[4]

This survey has outline the basic knowledge, attitudes and practice of private physicians in Pasig and Mandaluyong. Data from this survey will hopefully help in directing and prioritizing future efforts in involving the private sector in the DOTS strategy.

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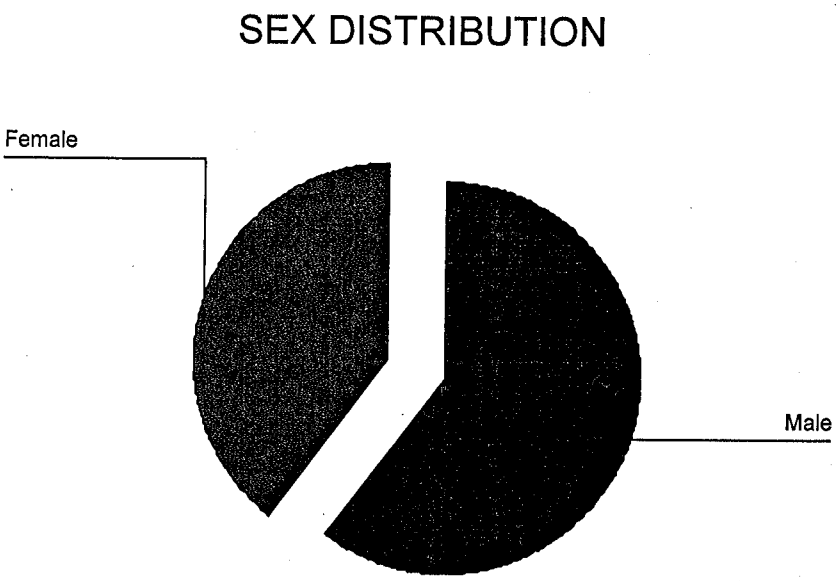
Figure 1:



Male- 64%

Female- 36%

Figure 2:

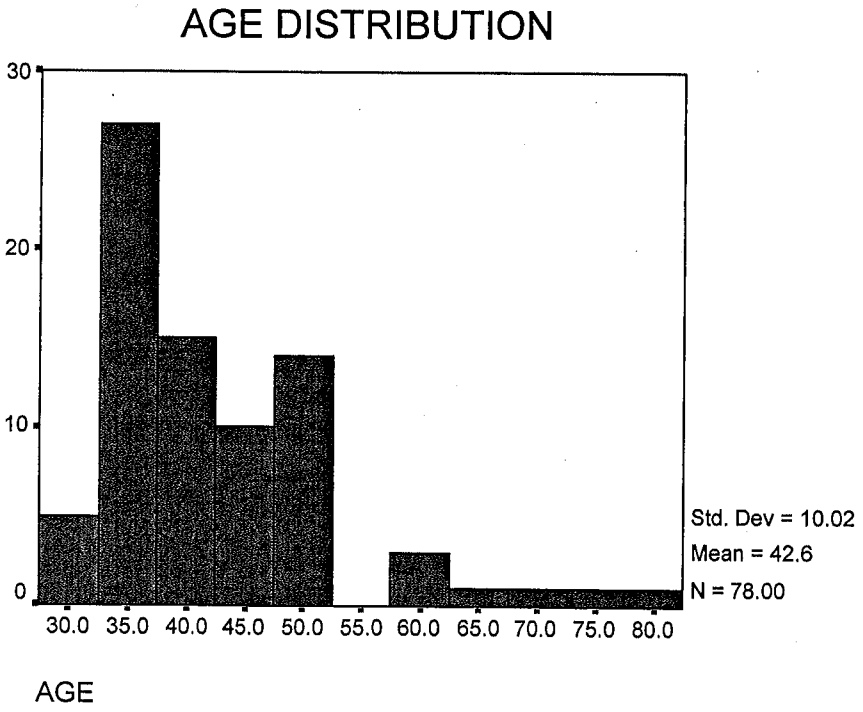
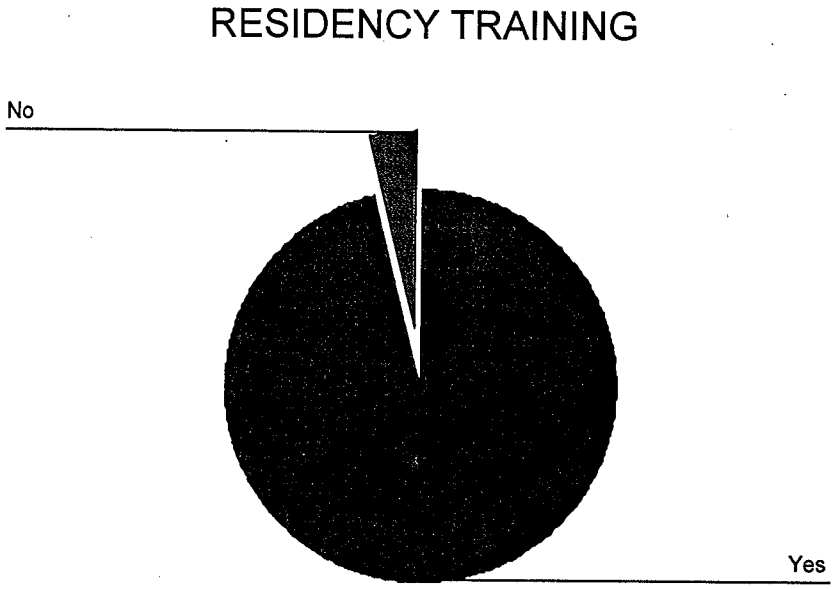


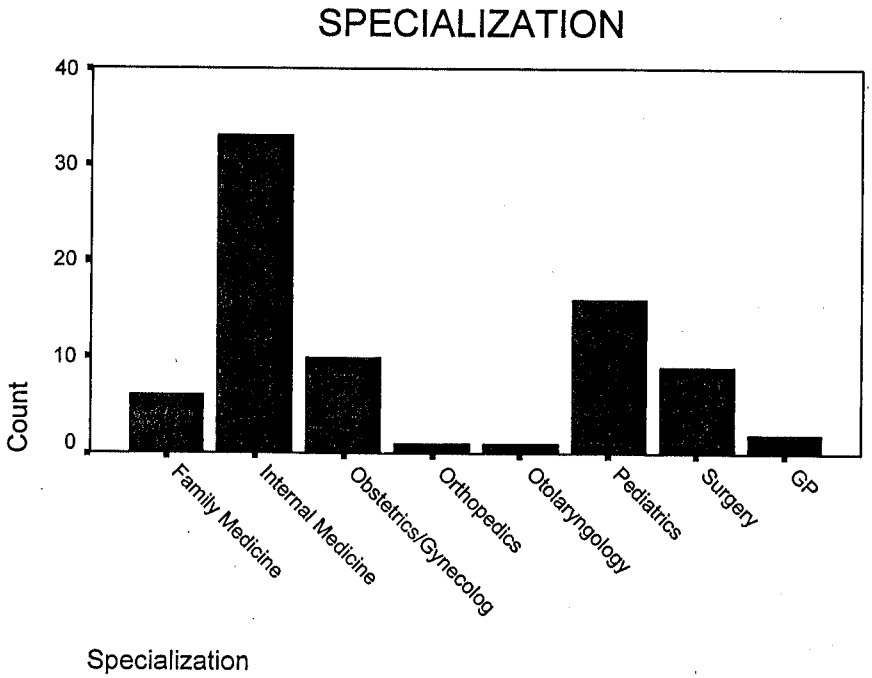
Figure 3:



Specialist- 95%

General Practitioner- 5%

Figure 4:



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The 1997 Nationwide Tuberculosis Prevalence Survey in the Philippines

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SUMMARY

SETTING: The Philippines is a developing country where tuberculosis (TB) remains a significant public health problem.

OBJECTIVE: To determine the prevalence of TB as a basis for setting the targets of the National Tuberculosis Control Program.

STUDY POPULATION AND METHODS: A multi-stage cluster survey of a random sample of 21960 subjects from 36 clusters nationwide was undertaken from 2 April to 31 July 1997. BCG scar verification and tuberculin testing was performed for subjects aged 2 months and over, and chest radiography screening was done on subjects 10 years and older. Sputum samples were collected from individuals who were initially assessed to have abnormal chest radiographs to determine the prevalence of bacillary tuberculosis. Acid-fast smear by modified Kinyoun's technique and culture on Löwenstein Jensen were done to demonstrate *Mycobacterium tuberculosis.*

RESULTS: The prevalence of active pulmonary TB was 42/1000 population. The prevalence of culture-positive and smear-positive cases was 8.1 and 3.1/1000, respectively. The prevalence was similar in urban and rural areas.

CONCLUSION: Morbidity from TB remains high. Allowing for methodological differences from the survey in 1981–1983, the prevalence of active pulmonary TB was unchanged. There was only a minimal decrease, of 37% for smear-positive cases and 25% for culture-positive cases, in the 14-year interval.

KEY WORDS: Philippines; *M. tuberculosis*; prevalence survey

THE FIRST NATIONAL tuberculosis prevalence survey in the Philippines was undertaken in 1981–1983.[1] The findings from that survey showed that the prevalence of bacteriologically confirmed tuberculosis was 8.6/1000 population for culture-positive and 6.6/1000 for smear-positive tuberculosis. The prevalence of radiographic findings suggestive of active pulmonary tuberculosis (PTB) was 4.2%. The annual risk of infection was 2.5%.

The Department of Health (DOH) deemed it necessary to undertake the 1997 Nationwide Tuberculosis Prevalence Survey (NTPS) in order to determine the present magnitude of the tuberculosis problem. The results of this survey will serve as the basis for the course of action that the DOH will take to control tuberculosis in the Philippines.

MATERIALS AND METHODS

Study design and study population

This multi-stage cluster study was undertaken to determine the prevalence of active pulmonary tuberculosis and bacillary disease. The estimated sample size for the national prevalence survey was 21 600 subjects. This was based on the assumptions that the estimate of the overall prevalence among those aged 10 years and over were within 25% of the true value with 95% confidence; the presumptive prevalence of bacillary tuberculosis was 6/1000; the expected coverage by radiographic examination was 85%; the expected coverage by sputum examination among persons with radiographic abnormalities was 100%; about 73% of the population was aged 10 years and above; and that the design effect was 1.25 for the use of cluster sampling instead of simple random sampling.

A stratified multi-stage design was utilized in selecting the sample population. The population was selected from three strata: Metro Manila, other urban areas and rural areas. The allocation of clusters across strata was in proportion to the population sizes (PPS), based on the 1995 census from the Philippine National Statistics Office.

The first stage was the selection of provinces or cities within each stratum. Accordingly, five cities within

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Metro Manila, 10 provinces representing other urban areas, and 21 provinces representing the rural areas were selected. In each province selected, a municipality was drawn first, and then a barangay (village) chosen based on PPS. Each cluster comprising 600 subjects was randomly selected from the barangay following a pre-determined procedure.

Survey procedures

The field survey was undertaken by six teams from 1 April to 31 July 1997. Registration of the subjects in the cluster was done through house-to-house visits, at which time bacille Calmette Guérin (BCG) coverage was ascertained and tuberculin testing was performed in subjects aged 2 months and over. The tuberculin test induration was measured 2–3 days later during a cluster assembly of the subjects. Results of the tuberculin tests will be reported separately. Chest radiography screening was done on individuals aged 10 years or older using mobile units equipped with 200–300 MA X-ray machines and a standard 10 × 14 inch chest film. The chest films were interpreted initially by field readers and later read independently by two senior radiologists. In case of any discrepancy in the readings, a referee reader was consulted. The chest radiography was read following the diagnostic standards and classification of tuberculosis as recommended by the American Thoracic Society.[2]

All those deemed to have an abnormal chest radiograph by the field readers were requested to submit three sputum specimens collected on three separate occasions following recommended procedures.[3] In some subjects who were unable to expectorate spontaneously, sputum was induced by nebulized supersaturated saline aerosol. The sputum specimens were then shipped to the research laboratory in ice within 24–72 hours of collection.

Laboratory procedures

A direct smear was prepared from each sputum specimen in the central research laboratory prior to processing. Screening microscopy of the smear was done with a fluorescence microscope using the auramine-rhodamine stain.[4] Smears that were positive by screening microscopy were stained by the acid-fast modified Kinyoun's technique.[5] The stained sputum smears were read independently by two readers, with a referee consulted in case of discrepancy.

The sputum specimen was liquefied and decontaminated with 4% NaOH in N-acetyl L-cysteine. The processed specimen was then centrifuged at 3000 × G in a refrigerated centrifuge for 20 minutes. A portion of the sediment of the specimen was inoculated onto two slants of Löwenstein Jensen (LJ) medium and the remainder was stored at −70°C. The culture tubes were incubated in CO_2 at 37°C and inspected weekly to determine the presence of bacterial growth. The identification of *M. tuberculosis* was confirmed using standard biochemical methods.[6] In case of contamination of the culture tube, the stored processed sediment from the specimen was again decontaminated and another set of LJ tubes was inoculated with the reprocessed specimen. Susceptibility to isoniazid, rifampicin, streptomycin and pyrazinamide was determined; these results will be reported separately.

Data processing and analysis

Data obtained from the field survey and the procedures performed were coded on the survey instrument and edited by the field interviewers. Field and laboratory data were computerized at the headquarters using Epi Info version 6.[7] Data were validated by double entry and files were later merged. Analysis of the data was done using SPSS version 7.5.[8]

Statistical analysis consisted primarily of the estimation of prevalence rates (proportions). Estimates of the prevalence were initially obtained for each cluster and weighted variance error per stratum was computed to derive the overall variance of the prevalence estimate. The standard error of the prevalence estimate was derived from the square root of the variance. The formula accounted only for the variation in the cluster level and variation for the other stages was not considered.[9] Consequently, the computed sampling errors are likely to be underestimates. Confidence intervals were computed assuming that the prevalence estimates follow normal distribution upon repeated sampling.

To correct for non-coverage in 19% of the population eligible for chest radiography, the observed estimates were adjusted based on the relative risk in those not examined. There was strong evidence that those with chest symptoms (cough of 2 weeks or more, haemoptysis, chest and/or back pain of one month or more, fever of one month or more) presented for X-ray more often than those without; the proportions were 92% and 84%, respectively ($P < 0.001$). This association was evident in either sex: 93% and 86% in males, respectively ($P < 0.001$) and 90% and 83% females, respectively ($P < 0.001$), and was also present in the various age groups. The magnitude of this association was utilized to obtain the relative risk (RR) of a person without a radiograph having chest symptoms compared to a person with one. The RR of a person without a radiograph having chest symptoms has been considered to approximate the RR of that person having radiographic tuberculosis. If the RR was assumed to be lower in those who were not examined, this was taken to be 0.46 for males aged 10–19, 20–29, 30–39, 40–49, and 0.8 for males aged 50 years or more; for females, it was taken to be 0.69 for all ages.

To adjust for the non-coverage by sputum examination in approximately 14% of the eligible population, the culture-positive and smear-positive yields observed in subjects according to their radiographic

abnormality were applied to those subjects without sputum specimens. The prevalence of bacillary disease among those not examined was estimated after the above adjustment of estimates of radiographic tuberculosis was applied among those who had no chest radiography.

RESULTS

Population surveyed

A total of 21 960 persons were surveyed from 21 rural and 15 urban clusters. Of these, 3048 (13.9%) were from Metro Manila, 6111 (27.8%) from other urban areas, and 12 801 (58.3%) from the rural areas. These were proportionate samples of the national population, which comprised 13.78% in Metro Manila, 28.95% in other urban areas, and 57.27% in rural areas. Males constituted 50.2% of the total population surveyed.

Approximately half of the total population was under 20 years of age, including 27.6% who were aged under 10 years. However, only 47.6% of the population surveyed in Metro Manila were aged under 20 years, compared to about 51% in other urban areas as well as in the rural areas. There were proportionately more individuals in the age-group 20–39 years in Metro Manila (35.1%) than in the other urban (27.9%) and rural (27%) areas. Conversely, proportionately less individuals aged 40 years and over were noted in Metro Manila (17.3%) than in the other urban (21%) or rural areas (22.3%).

Coverage of examinations done in the survey

Of the 15 905 (72.4%) subjects aged 10 years or older who were eligible for chest X-ray examination, 12 850 (81%) were X-rayed. Of these, 1619 were considered to have abnormal chest radiography, and 1390 (86%) had sputum specimens submitted for bacteriological examination during the cluster activities. To improve on the coverage of sputum collection, another attempt to collect sputum was made about 3–5 months after the field work, and an additional 151 patients submitted specimens. Thus, a total of 1541 (95%) sputum specimens were eventually collected from the 1619 individuals with abnormal chest X-rays. Only those collected from the first 1390 (86%) of the 1619 eligible individuals were analyzed, as the results of the last 151 individuals may not accurately reflect the situation during the actual survey. However, data from the latter were used to validate the predicted numbers of smear-positive and culture-positive cases from among those not sampled in the general collection of specimens.

Observed prevalence of tuberculosis

Of the 1619 subjects initially considered to have abnormal chest X-ray by the field readers, a total of 537 (42/1000 ± 3.3; 95% confidence interval [CI] 35–48) of the 12 850 individuals examined had radiographic findings suggestive of tuberculosis. This included minimal lesions in 442 (34.4/1000) and moderate or advanced lesions in 91 (7.1/1000), including 34 (2.6/1000) with cavitation.

There was a positive correlation between the prevalence of radiographic abnormalities suggestive of pulmonary tuberculosis (PTB) and age. Those in the 10–19 year age group had the lowest prevalence (6/1000) and those in the group aged 60–69 years had the highest prevalence (122/1000). The preponderance of males (53/1000) compared to females (31/1000) was noted in all ages. When the two sexes were combined, the prevalence in the rural (41/1000) and the urban (42/1000) areas, however, was similar.

Bacillary disease was confirmed in 127 of 1390 individuals studied among the 1619 subjects who were eligible for sputum examination. These included 47 who had positive direct smears and 124 who had positive cultures; of these, three were smear-positive and culture-negative, 44 were both smear- and culture-positive, and 80 were smear-negative and culture-positive. The observed prevalence was 11.2/1000 ± 1.22 (95% CI 8.78–13.55) for culture-positive and 4.3/1000 ± 1.36 (95% CI 1.71–7.04) for smear-positive cases. When extrapolated to the entire population surveyed, assuming no sputum-positive cases occurred in children under 10 years of age, the culture-positive rate was 8.1/1000 ± 0.88 (95% CI 6.35–9.81) and the smear-positive rate was 3.1/1000 ± 0.99 (95% CI 1.24–5.10) population.

There was a higher prevalence of culture-positive tuberculosis in males compared to females (16.41 vs 6.37/1000, respectively). This was also observed for smear-positive cases (6.49 vs 2.07/1000, respectively). When both sexes were combined, the prevalence of culture-positive and smear-positive cases was similar for the total urban (11.1 and 5.0/1000, respectively) compared to the rural area (11.4 and 3.8/1000, respectively). In the urban area, the rates in Metro Manila were lower (7.4/1000 for culture-positive and 3.3/1000 for smear-positive cases) than in other urban areas (12.6 and 5.8/1000, respectively). There was no consistent association between age and the prevalence of bacteriologically confirmed tuberculosis. The highest prevalence in the total population was observed in the age group 40–49 years for both culture-positive and smear-positive cases (20.65/1000 and 8.92/1000, respectively). The corresponding prevalence of pulmonary tuberculosis observed in the 1981–1983 nationwide survey is shown for comparison (Table 1).

Adjustment of prevalence rates for non-coverage

The adjusted prevalence of radiographic tuberculosis in the total population, after correcting for non-coverage in 19% of the population eligible for chest radiography, was 38/1000 ± 3.1 (95% CI 32–45) overall; it

Table 1 Observed prevalence (per 1000) of pulmonary tuberculosis (PTB) in the 1981–1983 and 1997 nationwide tuberculosis prevalence surveys, in subjects aged 10 years and over

	1981–1983*				1997			
	No. eligible	Active PTB	Culture-positive TB	Smear-positive TB	No. eligible	Active PTB	Culture-positive TB	Smear-positive TB
Total	16349	42	12.5	9.5	15905	42	11.2	4.3
Area								
Urban	5455	41	13.1	5.0	6648	42	11.1	5.0
Rural	10894	45	12.3	10.9	9257	41	11.4	3.8
Sex								
Male	7929	50	16.2	12.6	7817	53	16.4	6.5
Female	8420	35	9.3	6.9	8080	31	6.4	2.1
Age (years)								
10–19	5863	5	1.3	0.4	4989	6	3.7	1.2
20–29	3618	20	9.1	7.1	3308	24	7.5	3.0
30–39	2387	51	18.4	14.4	2936	48	17.5	4.4
40–49	1882	69	20.6	17.4	1977	60	20.6	8.9
50–59	1248	105	32.4	27.3	1179	89	13.8	7.0
≥60	1351	137	28.7	18.8	1273	121	20.3	8.9

* Data adapted from Reference 1.

was 49/1000 for males compared to 29/1000 for females, assuming that the relative risk for tuberculosis was lower in those not examined by chest X-ray (Table 2). Assuming that the prevalence was the same among those examined and those who were not, the adjusted prevalence for radiographic changes suggestive of PTB was 42 ± 3.3/1000 (95% CI 35–48) overall—53/1000 in males and 30/1000 in females.

The adjusted prevalence of radiographic tuberculosis in Metro Manila was 36/1000, in other urban areas it was 40/1000, and in combined urban areas it was 39/1000, compared to 38/1000 for the combined rural areas. Assuming equal risk in those not examined, it was similar in the total urban areas (42/1000) and in the rural areas (41/1000).

Table 2 Adjusted prevalence (per 1000) of pulmonary tuberculosis in subjects aged 10 years and over, 1997

	Active pulmonary tuberculosis	Culture-positive tuberculosis	Smear-positive tuberculosis
Total		9.8†	3.6†
Area			
Metro Manila	36–40	6.4	2.8
Other Urban	40–43	10.6	4.8
Total Urban	39–42	9.0	4.1
Rural	38–41	10.1	3.4
Sex			
Male	49–53	13.9	5.4
Female	29–30	5.8	1.9
Age (years)			
10–29	12–13	4.0	1.5
30–49	48–53	15.7	5.3
≥50	100–103	16.5	7.1

* Range of adjusted prevalence of active PTB assuming lower risk, and assuming equal risk in those not examined compared to those examined.
† Adjusted prevalence per thousand corrected for those not examined by screening radiography and sputum examination.

The predicted numbers of culture-positive and smear-positive cases in the 229 subjects who did not provide sputum specimens for examination were 12.5 and 3.1, respectively. These predicted numbers were subsequently validated by results obtained from sputum smear testing of specimens from 151 of the 229 subjects collected 3–5 months after the actual survey, from which six culture-positive and two smear-positive cases were observed; in the remaining 88 non-examined subjects, the expected numbers of culture-positive and smear-positive cases were 5.0 and 1.4, respectively. The sum of observed plus expected smear-positive and culture-positive cases among those not examined would then be 11.0 and 3.4, respectively, compared to the 12.5 and 3.1 predicted. Accordingly, of the 1619 subjects with a radiographic abnormality, the estimated total number of culture-positives was 136.5 (124 + 12.5), and the estimated number of smear-positives was 50.1 (47 + 3.1).

To correct for the non-coverage of approximately 19% of the population eligible for chest radiography, the adjusted prevalence rates were 9.8/1000 culture-positive and 3.6/1000 smear-positive cases.

The adjusted prevalence of culture-positive cases was 6.4/1000 and that of smear-positive cases 2.8/1000 in Metro Manila, 10.6 and 4.8/1000, respectively, in other urban areas, 9.0 and 4.1/1000, respectively, in the total urban area, and 10.1 and 3.4/1000, respectively, in rural areas. The prevalence of culture-positive and smear-positive cases was 13.9 and 5.4/1000, respectively, in males, and 5.8 and 1.9/1000, respectively, in females. For the age group 10–29 years, it was 4.0 and 1.5/1000, respectively, for those aged 30–49, it was 15.7 and 5.3/1000, respectively; and for those 50 years and older, it was 16.5 and 7.1/1000, respectively.

Comparison between the 1997 and the 1981–1983 National Tuberculosis Prevalence Surveys

In comparing the 1997 and 1981–1983 surveys, methodological differences in the field work and laboratory techniques between the two surveys were taken into account. Chest radiography was performed using 10 × 14 inch films in the 1997 survey and a 70 mm photofluorogram in the 1981–1983 survey. While the rates of total radiographic abnormalities suggestive of pulmonary tuberculosis were identical in the two surveys (4.2/1000), there was a 58% reduction in moderate or far advanced disease (7.1 vs 1.7/1000) and a 48% reduction in cavitary disease (2.6 vs 4.7/1000). Conversely, there was an increase of 39.6% in cases with minimal lesions.

There was not much difference in the prevalence of culture-positive cases: 8.1/1000 in the 1997 NTPS vs 8.6/1000 in the 1981–1983 NTPS. To allow for a meaningful comparison, the observed culture-positive and smear-positive rates in the 1997 NTPS were standardized using the frequency of observed radiographic abnormalities in the 1981–1983 population (Table 3). The expected number of positive cultures in 1981–1983 using the methods employed in the current survey should have been 185.5, which would exceed the actual observed yield of 156 in 1981–1983 by 1.2 (185.5/156) times. The difference in the expected and observed yields was statistically significant ($\chi^2 = 4.82$, $P < 0.05$).

Although the culture technique used was essentially the same, homogenization and centrifugation were probably more efficient in the 1997 NTPS. This being so, when comparing the two surveys, the observed culture-positive yield of 11.2/1000 in 1997 should be adjusted by 0.84 times (156/185.5, i.e., 9.4/1000), which should then be compared to the observed prevalence of 12.5/1000 in the 1981–1983 survey. This would indicate a 25% reduction in the culture-positive case prevalence.

The smear-positive yield using the methods employed in the 1997 NTPS, on the other hand, was appreciably lower by a factor of 29% (84.0/119). The difference between expected and observed rates was also statistically significant ($\chi^2 = 16.84$, $P < 0.001$). This finding suggests an underestimation by acid-fast bacilli (AFB) smear on direct smears in the present survey. The prevalence of smear-positive patients in the 1997 NTPS was appreciably lower than in the 1981–1983 NTPS (3.1/1000 vs 6.6/1000). With standardization to correct for underestimation by adjusting the observed rate of 4.3/1000 in persons 10 years or older by 1.4 times (119/84), the adjusted prevalence rate would be 6.0/1000 in those 10 years or older. Compared to the 9.5/1000 reported in 1981–1983, this would reflect a 37% reduction in smear-positive cases.

Table 3 Comparison of prevalence rates (per 1000) in the 1981–1983 and 1997 surveys, in subjects aged 10 years and over

	1981–1983	1997
Radiologically active pulmonary tuberculosis	42	42
Bacillary disease		
Culture-positive		
Observed	12.5	11.2
Standardized		9.4
Extrapolated	8.6	8.1
Smear-positive		
Observed	9.5	4.3
Standardized		6.0
Extrapolated	6.6	3.1

DISCUSSION

Since the first survey in 1981–1983, this has been the only systematic study undertaken nationwide to measure the magnitude of the problem of tuberculosis in the Philippines using standard epidemiological tools. The coverage attained with the various examinations in this survey was comparable to that of the 1981–1983 survey, and was deemed satisfactory. However the initial target of 85% coverage for chest radiography was not met, and the initial coverage in sputum collection was far from ideal. To arrive at reasonable estimates of the prevalence of both bacillary disease and radiographic tuberculosis, a logical method of correcting the effect of this non-coverage was employed based on a judicious assessment of the characteristics of those not examined compared to those examined. Based on the finding that the prevalence of subjects with TB symptoms among those who were examined radiographically was significantly higher than in those who were not examined, the observed rates reported herein might actually be overestimates of the true prevalence if the total eligible population were examined.

All the parameters of disease were higher in males compared to females, but were essentially similar for urban and rural populations. The observed prevalence of bacillary tuberculosis of 8.1/1000 population for culture-positive cases and 3.1/1000 population for smear-positive cases implies that in a population of approximately 70 million Filipinos, there are approximately 200 000 to 500 000 people who are effectively infecting 10–20 persons each per annum. This translates to 2–10 million new cases of TB infection per year. As a result, the Philippines is reported as one of the top 22 countries that are cumulatively contributing 80% of estimated cases globally.[10]

After adjusting for technological differences between the present survey and that performed 15 years previously, the observed rates showed a minimal decline in bacillary disease. These findings are consistent with our observation that although the prevalence of radiographic findings suggestive of PTB was identical in the two surveys there were more minimal lesions and

fewer patients with moderate or far advanced and cavitary disease in the present survey. Consequently, there were more patients with low bacillary load in the present survey that could not be identified by a direct smear but from whom bacteria could still be isolated with the culture techniques applied.

Nevertheless, the reported parameters of tuberculous disease in this survey indicate that the morbidity due to tuberculosis has remained substantially high. From 1980–1996 there was a reported increase in the number of tuberculosis cases notified in the Philippines.[10]

As of 1996, the coverage of directly observed treatment, short course (DOTS) was only 2% of the population.[10] Prior to that, in 1993, an evaluation of the National TB Control Program undertaken in four regions in the Philippines showed that there was no actual monitoring and supervision of patient treatment and response. Treatment of newly diagnosed cases was often delayed, and coverage was inadequate, primarily due to the inconstant supply of drugs.[11]

More recently, improved cure rates, of from 60% to more than 80% of smear-positive cases, were reported from the World Health Organization-assisted pilot projects on DOTS in three provinces. As of February 1998, 8% of the Philippine population had access to DOTS, and 25% of the population by the end of 1998. It is planned that this will increase to 50% by 1999 and 100% by 2001.[12] It is anticipated that the prevalence of tuberculosis will decline with the implementation of DOTS similar to the progressive drop in the prevalence of tuberculosis and the number of tuberculosis cases notified in Korea in the period 1965–1995 as the coverage of DOTS among new cases increased, particularly in the past 15 years.[10,13]

CONCLUSION

Morbidity from tuberculosis remains high in the Philippines. Compared to the first survey in 1981–1983, the decline in the prevalence of bacillary disease is minimal. Replicating the success of DOTS through its planned incremental implementation nationwide should greatly enhance the National TB Control Program of the Philippines.

Acknowledgements

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RÉSUMÉ

CADRE : Les Philippines sont un pays en développement où la tuberculose (TB) reste un problème majeur de santé publique.

OBJECTIF : Déterminer la prévalence de la TB comme base d'établissement des cibles du programme national de lutte contre la tuberculose.

POPULATION ETUDIEE ET MÉTHODES : Enquête entreprise du 2 avril au 31 juillet 1997 (grappes à stades multiples d'un échantillon aléatoire de 21 960 sujets provenant de 36 grappes choisies à l'échelle nationale). La vérification des cicatrices de BCG et les tests tuberculiniques ont été assurés pour les sujets âgés de 2 mois ou davantage. Une radiographie du thorax a été faite chez les sujets de 10 ans ou davantage. Des échantillons d'expectorations ont été recueillis chez les individus dont les clichés thoraciques initiaux étaient anormaux, afin de déterminer la prévalence de la tuberculose contagieuse. *Mycobacterium tuberculosis* a été mis en évidence par la technique de Kinyoun modifiée pour recherche de l'acido-résistance des bacilles et par la culture sur milieu de Loewenstein-Jensen.

RÉSULTATS : La prévalence de la TB pulmonaire active a été de 42 pour mille habitants. La prévalence des cas à culture positive et examen direct positif fut respectivement de 8,1 et 3,1 pour mille habitants. La prévalence était similaire dans les zones urbaines et rurales.
CONCLUSION : La morbidité tuberculeuse reste élevée. Si l'on tient compte des différences méthodologiques par rapport à l'enquête de 1981 à 1983, la prévalence de la TB pulmonaire active est inchangée. Au cours de cet intervalle de 14 ans, l'on n'a observé qu'une diminution minime de 37% pour les cas à bacilloscopie positive et de 25% pour les cas à culture positive.

RESUMEN

MARCO DE REFERENCIA: Filipinas es un país en desarrollo en el que la tuberculosis (TB) sigue siendo un problema significativo de salud pública.
OBJETIVO: Determinar la prevalencia de la TB para establecer los objetivos del programa nacional de control de la TB.
POBLACION Y MÉTODOS: Una encuesta en grupos de múltiples estados, en una muestra al azar de 21960 individuos obtenidos de 36 grupos de todo el país, del 2 de abril al 31 de julio de 1997. Se comprobó la cicatriz de BCG y se efectuó el test tuberculínico en las personas de 2 meses de edad o más. Se efectuó una radiografía de tórax en las personas de 10 años o más. Se recogieron esputos de los individuos que tenían una radiografía anormal para determinar la prevalencia de tuberculosis bacilar. Se realizaron análisis de los frotis de esputos con la técnica modificada de Kinyoun para la ácido-resistencia y cultivo en el medio de Löwenstein-Jensen para documentar la presencia de *Mycobacterium tuberculosis*.
RESULTADOS: La prevalencia de TB activa era de 42 por 1000 habitantes. La prevalencia de cultivos positivos y baciloscopias positivas fue 8,1 y 3,1 por 1000, respectivamente. La prevalencia fue igual en las áreas urbanas y rurales.
CONCLUSIÓN: La morbilidad por TB permanece elevada. Admitiendo las diferencias metodológicas de la encuesta de 1981 a 1983, la prevalencia de la TB no ha cambiado. Hubo solamente una disminución mínima del 37% en los casos con baciloscopia positiva y del 25% en los casos con cultivos positivos en el intervalo de 14 años.

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BCG coverage and the annual risk of tuberculosis infection over a 14-year period in the Philippines assessed from the Nationwide Prevalence Surveys

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SUMMARY

SETTING: A prevalence survey of tuberculosis (TB) infection was undertaken in the Philippines, a developing country in the Western Pacific region.

OBJECTIVE: To determine the bacille Calmette Guérin (BCG) vaccination rate, the prevalence of TB infection and the annual risk of TB infection (ARTI).

METHODS: A nationwide stratified multi-stage cluster survey of 21 960 individuals. BCG scar verification and tuberculin test were performed on those aged ≥2 months. The ARTI was calculated using the prevalence rates of TB infection in children aged 5–9 years.

RESULTS: BCG scars were noted in 66% of the study population. The prevalence of TB infection was 63.4% among unvaccinated individuals. The prevalence rate was higher in males in both urban and rural areas. With both sexes combined, urban and rural communities had similar prevalence rates. In children aged 5–9 years, the prevalence rate was 16.1% (males 17.4%, females 14.9%), corresponding to an ARTI of 2.3% (males 2.5%, females 2.1%).

CONCLUSION: BCG coverage increased substantially between 1981–1983 and 1997. The ARTI, however, was virtually unchanged, indicating that morbidity due to TB continued to be high.

KEY WORDS: Philippines; BCG; tuberculin test; prevalence survey; annual risk of TB infection (ARTI)

TUBERCULOSIS remains an important public health problem in the Philippines. A nationwide prevalence survey was undertaken from 2 April to 31 July 1997 to measure the magnitude of the problem. Data derived from this survey were to be used as a basis for setting realistic goals for a revised national tuberculosis control programme. As part of the survey, coverage with BCG vaccination and the prevalence of tuberculosis (TB) infection were determined. The annual risk of TB infection (ARTI), which is the probability that a previously uninfected person will be infected during the ensuing period of one year,[1] was determined from the prevalence of TB infection in children aged 5–9 years. Comparisons with the findings of an earlier national prevalence survey in 1981–1983[2] were done, to assess any trends over the 14-

This study was undertaken under the supervision of the Steering Committee headed by A S Lopez, Undersecretary of Health, with members: A N Acosta, A Galvez, M Mantala, N Cruz, A Sarmiento, Dong Il-Ahn, TB Adviser WHO-WPR, S Radhakrishna, WHO consultant.

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year period; similar comparisons in terms of radiographic and bacteriological findings have recently been published.[3]

MATERIALS AND METHODS

Study population and design

A stratified multi-stage cluster design was employed, the three strata being Metro Manila, other urban areas and rural areas. The estimated sample size was 21 600, comprising 36 clusters of 600 subjects each.[3] At the first stage, five cities in Metro Manila, 10 provinces in other urban areas and 21 provinces in rural areas were selected by probability proportional to size (PPS) method. From each of these, a municipality was selected by PPS and from it a barangay (village) was chosen, again by PPS. From each barangay, a cluster of 600 subjects was selected by a random process described in detail elsewhere.[4] The study sample comprised 21 960 subjects: 3048 from Metro Manila, 6111 from other urban areas, and 12 801 from rural areas.

Survey procedures

BCG coverage

Six teams undertook the survey during the period April–July 1997. Subjects aged 2 months or older were examined for BCG scars; the examiner inspected the entire arm, including the deltoid area. The scar, if present, was examined to determine if it had a glossy appearance when reflected against any source of light by gently pressing towards the centre using the thumb and index finger. The number of BCG scars present was noted. If a scar was present but did not possess the characteristics of a BCG scar, it was not counted.

Tuberculin testing

Tuberculin testing was performed according to recommended procedures using 2 tuberculin units (TU) of purified protein derivative (PPD) RT 23 with Tween 80 purchased from Statens Serum Institute, Copenhagen, Denmark.[5] Intradermal injections were done during the house visits for registration of the survey sample or during the cluster assembly. Excluded from the test were individuals with fever, pregnant women, and those subjects who had received live vaccines such as MMR (mumps, measles and rubella) or oral polio vaccine in the preceding month.

The test was read 48–72 hours after injection. If an induration was present, its limits were determined. Its widest transverse diameter relative to the arm was measured using a small transparent 10 cm ruler and recorded in millimeters. The reading was made without prior knowledge of the BCG status or radiological or bacteriological examination results of the individual, so as to avoid any bias.

Six readers measured the tuberculin test indurations, one in each of the six survey teams. A standard reader from the Department of Health (DOH) had trained all of them prior to the start of the survey. To assure quality of data, readings of field workers were compared with those of the standard reader in 264 subjects during the field survey. The mean difference of the readings was 0.15 ± 2.7 mm which was not significant ($P > 0.1$).

Annual risk of TB infection

The annual risk of TB infection (ARTI) was determined from the prevalence of infection (p) in children aged 5–9 years who did not have a BCG scar, following the method of Sutherland.[1] In brief, ARTI $= 1 - (1-p)^{1/n}$, where n is the average number of years of the age-group studied; in this instance, $n = 7.5$.

RESULTS

Figure 1 shows the age-sex distribution of the study sample. Males constituted 50.2% of the 21 960 individuals surveyed. Approximately half of the population was aged under 20 years, including 27% who were aged under 10.

BCG vaccination coverage

In all, 90% of individuals aged over 2 months were examined for the presence of a BCG scar, i.e., 86% of males and 92% of females (Table 1). The coverage was highest in children under 14 years, and was higher in rural areas (91%) than urban areas (88%).

Of a total of 19 631 individuals examined, 66% had a BCG scar (Table 1). The proportion was 70% in infants aged under one year; it then increased with age up to 10–14 years (81%) and declined thereafter. Urban subjects had a higher coverage (69%) than rural subjects (65%).

Deriving a criterion for tuberculosis (TB) infection

The histograms of the tuberculin test induration in various age groups are presented in Figure 2. None of them suggest a clear-cut anti-mode distinguishing the uninfected from the infected. Consequently, a discrimination type approach was employed to evolve a criterion.[6] The distribution of tuberculin test results in a predominantly uninfected group of 1100 unvaccinated children aged under 10 years was compared with that in a predominantly infected group of 386 unvaccinated subjects (of all ages) with radiographic evidence suggestive of tuberculosis, and an optimal cut-off point was determined such that the difference between the two groups in the proportion infected (employing this cut-off) was maximal. This was found to be 7 mm, with the proportions infected being 17% and 90%, respectively, a difference of 73%. It would have been ideal to make the comparison with bacteriologically confirmed cases who were unvaccinated,

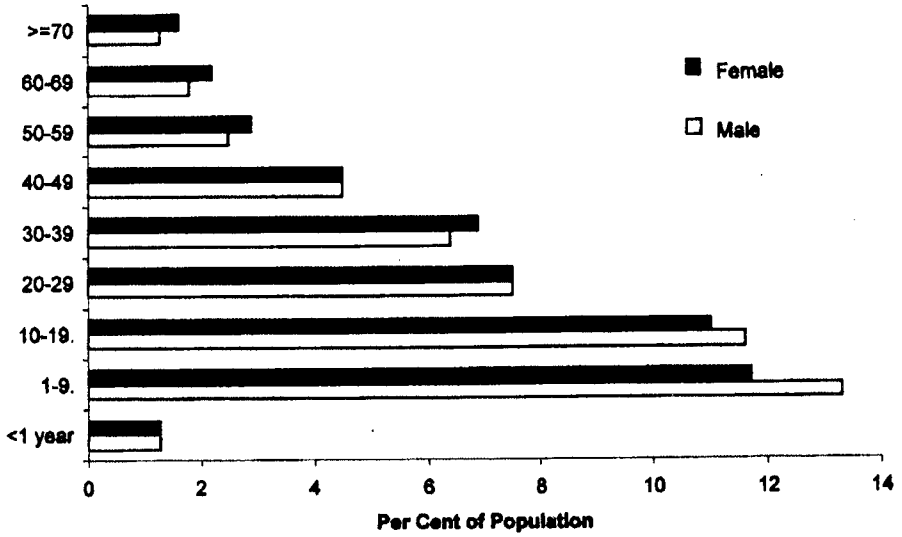

Figure 1 Age-sex distribution of the survey population.

but unfortunately the number of such cases was too small.

Non-specific low-grade sensitivity to tuberculin resulting from exposure to antigenically-related mycobacteria other than *Mycobacterium tuberculosis* (MOTT) in the environment is a common phenomenon in tropical countries.[7] This could lead to a misclassification of uninfected individuals as infected if the cut-off point is on the low side. It would therefore be prudent to make some allowance for this when deciding on a criterion, particularly since the observed prevalence of MOTT in this study was appreciably high, at 31.9 per thousand. Considering all the above aspects, it was decided that an induration of 8 mm or more would constitute the best definition of TB infection.

The distribution of tuberculin test results in 167 patients (with or without BCG scar) with culture-positive tuberculosis was studied (Figure 3). The mean tuberculin test induration size of these patients, excluding one subject with 0 mm induration, was 15.24 mm ± 3.75 mm. The lower 95% confidence limit was 7.9 mm. This suggests that a definitely infected individual would have an induration of at least 7.9 mm, or approximately 8 mm.

Table 1 Presence of BCG scar and prevalence of tuberculosis infection, by sex, age and urban/rural population

	BCG scar examination			Tuberculin test		
Characteristic	Eligible *n*	Examined (%)	Scar present (%)	No. with no scar *n*	Test done (%)	Prevalence of infection (%)
Sex						
Male	10975	86	67	3080	77	67.0
Female	10912	92	66	3412	81	60.3
Age (years)						
<1	496	92	70	137	37	7.8
1–4	2421	94	75	564	56	6.6
5–9	3065	94	80	555	79	16.1
10–14	2730	94	81	485	87	32.4
15–19	2259	87	80	395	80	50.8
20–29	3308	88	76	676	77	72.3
30–39	2936	90	70	784	81	81.3
40–49	1977	81	38	979	83	86.3
50–59	1179	85	22	769	85	84.3
60–69	867	89	13	662	87	77.4
⩾70	649	86	12	486	86	69.3
Area						
Urban	9125	88	69	2467	78	62.2
Rural	12762	91	65	4025	80	64.2
Total	21887	90	66	6492	79	63.4

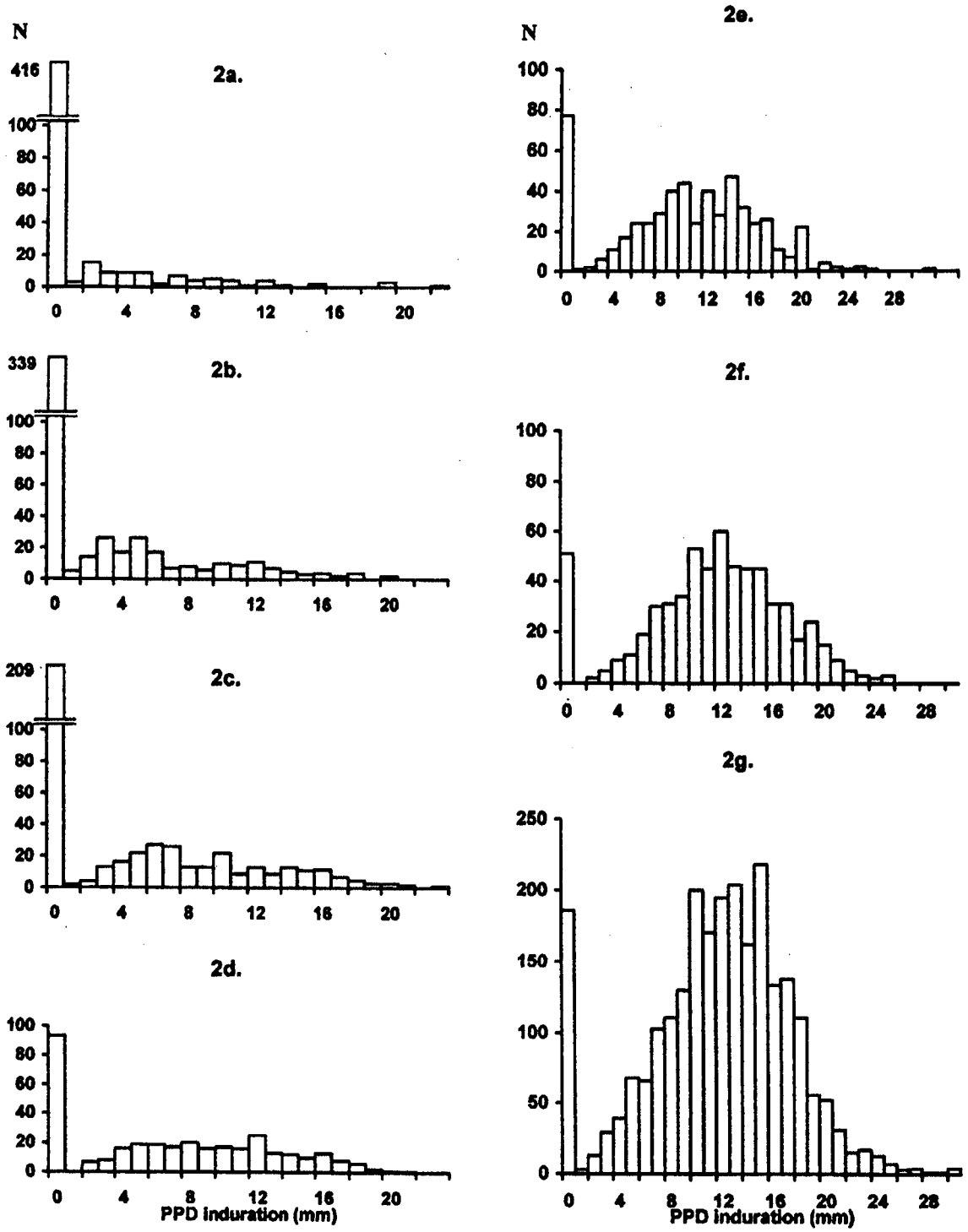

Figure 2 Distribution of PPD induration in unvaccinated individuals in various age groups: 2a) 0–4 years; 2b) 5–9 years; 2c) 10–14 years; 2d) 15–20 years; 2e) 20–29 years; 2f) 30–39 years; 2g) 40 years or older.

Prevalence of tuberculosis (TB) infection

Among the 6492 who had no BCG scar, 3080 were males and 3412 were females. A tuberculin test was undertaken in 79% of these (77% of males and 81% of females) (Table 1). Infants aged less than one year had the lowest coverage (37%), followed by those in the age-group 1–4 years (56%), because many of them were ineligible for PPD due to a recent intake of oral polio vaccine.

Based on a cut-off of 8 mm, the prevalence of TB infection in unvaccinated individuals was 63.4%. It was higher in males (67.0%) than in females (60.3%).

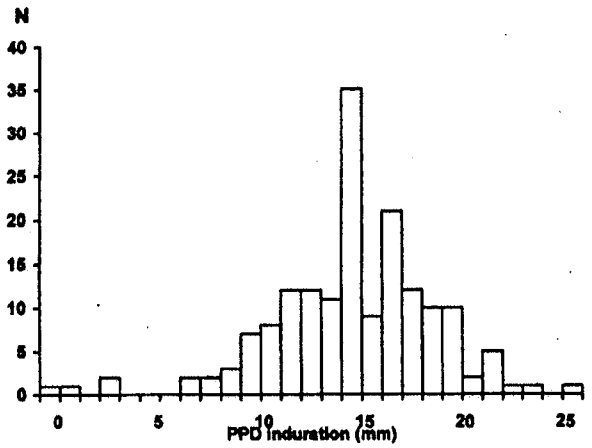

Figure 3 Distribution of PPD induration in patients with bacteriologically confirmed tuberculosis.

There was a tendency towards increase with age, the highest being 86.3% in the age-group 40–49 years. There was no difference in the prevalence between urban (62.2%) and rural (64.2%) populations.

Annual risk of TB infection

The prevalence of infection in children aged 5–9 years was 16.1% (17.4% in males and 14.9% in females). This corresponds to an ARTI of 2.3% (2.5% in males and 2.1% in females).

Comparison between the 1997 and the 1981–1983 surveys

The age-specific prevalence rates of BCG vaccination and TB infection in the present (1997) and earlier (1981–1983) nationwide surveys[2,3] are illustrated in Figure 4. As a result of the expanded programme of immunisation (EPI) in the Philippines, BCG vaccination coverage was substantially higher in 1997 than in 1981–1983 (66.4% compared to 40.1%) (Table 2). The improved coverage was very evident in children younger than 10 years (Figure 4a), indicating a better BCG immunisation programme in the preceding 10 years.

The age-specific prevalence rates of TB infection were slightly smaller in the 1997 survey than in the 1981–1983 survey at most ages (Figure 4b). However, the overall prevalence was higher in 1997 (63.4%) than in 1981–1983 (54.5%).[2] This apparent anomaly can be explained by differences in the age distribution of unvaccinated individuals in the two surveys. Because BCG vaccination coverage in children increased considerably between 1981–1983 and 1997, the unvaccinated subjects in 1997 were much older. Thus, subjects aged 30 years or more comprised 60% of the unvaccinated in 1997 compared to only 42% in 1981–1983. Conversely, those aged 10 years or less comprised only 16% in 1997 compared to 32% in 1981–1983. The standardised prevalence in

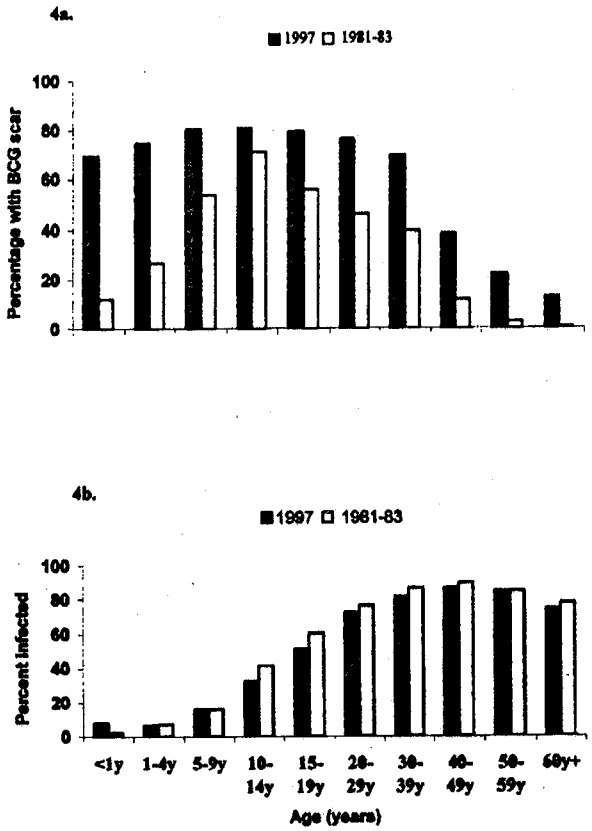

Figure 4 a) Age-specific BCG coverage in 1997 and 1981–1983. b) Age-specific prevalence of tuberculous infection in 1997 and 1981–1983, as assessed by nationwide tuberculosis prevalence surveys.

1981–1983, using the 1997 population age-structure, was 66.5%, which is very similar to the 1997 prevalence rate of 63.4%. The ARTI was 2.3% in 1997, which is not very different from the rate of 2.5% observed in 1981–1983.

DISCUSSION

BCG vaccination coverage has improved over the 14-year period between 1981–1983 and 1997, as part of the vigorous implementation of the EPI by the Depart-

Table 2 BCG coverage and prevalence of tuberculosis infection in unvaccinated subjects in 1997 and 1981–1983 nationwide prevalence surveys

Outcome measure	1997	1981–1983
BCG coverage (%)	66.4	40.1
Prevalence of tuberculosis infection (%) in unvaccinated individuals		
All ages	63.4	54.5 (66.5)*
Children aged 5–9 years	16.1	16.0
Annual risk of TB infection (%)	2.3	2.5

* Figure in brackets is the estimated prevalence in 1981–1983, with the 1997 age-structure of the population.

ment of Health. This was particularly true for children under 10 years of age.

As a standard procedure, the prevalence of TB infection is determined from the tuberculin test results of unvaccinated individuals in the community. There are a number of factors that could bias the results of the tuberculin test. Inter-observer variation from six tuberculin readers utilised in this survey due to time constraints may have imposed limitations in the homogeneity of the data. However, although the field readers tended to over-read as compared to the standard reader, the difference between their readings was not significant. Non-specific reaction due to the high prevalence of MOTT as well as the inclusion of BCG-vaccinated subjects due to the possibility of missed BCG scars could further confound the readings.

Furthermore, estimating the overall prevalence of infection in the unvaccinated may give a distorted picture. Characteristics inherent in the unvaccinated population, such as in this survey where the unvaccinated were older and consequently at greater risk, could influence the estimated prevalence of TB infection in the community. Although the prevalence of overall TB infection seemed higher in 1997 (63.4%) than in 1981–1983 (54.5%), the two became similar (63.4%, 66.5%) when the latter was standardised using the age-sex composition of the 1997 population.

The criterion for TB infection was 8 mm induration in the 1981–1983 survey, in which 1 TU PPD RT 23 was used. As the 1997 survey employed 2 TU PPD RT 23, a higher cut-off would have been expected. However, it remained the same at 8 mm. This apparent anomaly could be due to technical differences in the two surveys. Additionally, a possible decreasing potency of PPD RT23 through the years as reported by other workers,[8,9] despite claims to the contrary from Statens Serum Institut,[10] may account for this.

The magnitude of the tuberculosis problem in the Philippines has remained virtually unchanged in the past 14 years. The ARTI, a measure of the burden of illness in the community, is practically the same in the two surveys. The control programme for tuberculosis in the past 14 years appears to have had little impact on the ARTI. This is consistent with the meagre decline in the prevalence of bacillary TB observed in the 1997 survey as reported earlier.[3]

Case-finding and unsupervised short-course chemotherapy (SCC) for smear-positive and cavitary disease and a standard regimen for smear-negative cases were implemented nationwide in the Philippines in 1986. At the evaluation of the programme in 1993,[11] irregularities were noted in the drug supplies which led to significant delays in the start of treatment as well as low treatment coverage of infectious cases. The supervision methods of the programme were found to be ineffective, and there was a serious problem in case-holding. This has led to an increasing pool of untreated patients effectively transmitting the disease. This is consistent with an ARTI of 2.3%, indicating a high rate of transmission of infection in the community.

Directly observed treatment, short-course (DOTS) is a successful strategy utilised in a number of countries in the Western Pacific Region. DOTS was introduced in the Philippines only in 1996.[12] There was an observed increase in the cure rate from 60%–80% in the WHO-assisted pilot areas for DOTS.[13] However, since many of the patients requiring treatment do not utilise the government public health services, non-governmental organisations and private physicians play an important role in providing services for patients with tuberculosis.[11] Recruiting the private sector to participate in the national tuberculosis programme would greatly augment the on-going efforts of the DOH in view of the limited government resources available. It is anticipated that with private-public collaboration in the implementation of DOTS in the years to come, there should be a progressive decline in the prevalence of tuberculosis in the Philippines similar to that observed in Korea.[14]

CONCLUSION

BCG coverage has improved in the past 14 years. The prevalence of TB infection and ARTI have remained essentially unchanged since the 1981–1983 nationwide tuberculosis prevalence survey,[2] largely due to the inadequacies of the national tuberculosis control programme. DOTS, which will be implemented nationwide by the year 2001, has shown encouraging results in pilot areas. This is anticipated to diminish the burden of illness due to tuberculosis in the coming years.

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RÉSUMÉ

CADRE : Une enquête de prévalence de l'infection tuberculeuse (TB) a été entreprise aux Philippines, un pays en développement dans la région du Pacifique Ouest.
OBJECTIF : Déterminer le taux de vaccination par le BCG (bacille de Calmette et Guérin), la prévalence de l'infection tuberculeuse et le risque annuel d'infection tuberculeuse (ARTI).
MÉTHODES : Il s'agit d'une enquête par grappes à stades multiples et stratifiée au niveau national concernant 21 960 individus. On a vérifié la cicatrice de vaccination par le BCG et exécuté un test tuberculinique chez les sujets âgés de 2 mois ou davantage. ARTI a été calculé en utilisant les taux de prévalence de l'infection tuberculeuse chez les enfants âgés de 5 à 9 ans.
RÉSULTATS : On a noté des cicatrices vaccinales de BCG dans 66% de la population étudiée. La prévalence de l'infection TB fut de 63,4% parmi les individus non vaccinés. Le taux de prévalence est plus élevé chez les hommes, que ce soit en zone urbaine ou rurale. Pour les deux sexes combinés, les taux de prévalence sont similaires dans les communautés urbaines ou rurales. Chez les enfants âgés de 5 à 9 ans, le taux de prévalence était de 16,1% (17,4% chez les garçons et 14,9% chez les filles), ce qui correspond à un ARTI de 2,3% (soit 2,5% chez les garçons et 2,1% chez les filles).
CONCLUSION : La couverture par le BCG a augmenté de manière substantielle entre 1981–1983 et 1997. Toutefois le ARTI est resté virtuellement inchangé, ce qui indique la persistance d'une morbidité élevée due à la TB.

RESUMEN

MARCO DE REFERENCIA : Se llevó a cabo una encuesta de prevalencia de la infección tuberculosa (TB) en las Filipinas, un país en desarrollo en la región del Pacífico Occidental.
OBJETIVO : Determinar la tasa de vacunación con el bacilo Calmette Guerin (BCG), la prevalencia de la infección TB y el riesgo anual de la infección TB (ARTI).
MÉTODOS : Encuesta nacional estratificada en conglomerados de 21 960 individuos. Se efectuó la verificación de la cicatriz BCG y el test tuberculínico en las personas de 2 o más meses de edad. El ARTI se calculó utilizando las tasas de prevalencia de la infección TB en niños de 5 a 9 años de edad.
RESULTADOS : Se observaron cicatrices de BCG en el 66% de la población estudiada. La prevalencia de la infección TB fue del 63,4% en las personas no vacunadas. La tasa de prevalencia fue mayor en los varones, tanto en el área urbana como rural. Combinando ambos sexos, las comunidades urbana y rural tenían tasas de prevalencia similares. En los niños entre 5 y 9 años de edad, la tasa de prevalencia fue de 16,1% (varones 17,4%, mujeres 14,9%), correspondiendo a un ARTI de 2,3% (varones 2,5%, mujeres 2,1%).
CONCLUSIÓN : La cobertura con BCG aumentó llamativamente entre 1981–83 y 1997. El ARTI, sin embargo, no cambió, indicando que la morbilidad debida a la TB continúa siendo alta.

COUNTRY PROFILE

The Philippines

Overview of TB control system

The central, regional, and provincial governments in the Philippines each have clearly delineated roles in delivering health care. The central level of the NTP is responsible for overall programme management including the formulation of technical norms, provision of technical support, and drug procurement. Regional offices coordinate with, and provide technical support to, provincial governments. Following a national programme review conducted in 2002 by WHO and other partners, TB control in 2003 focused on maintaining quality, on expansion of DOTS to the remainder of the country, and on involving other sectors in TB control.

Surveillance, planning, operations

The notification rates of smear-positive cases and of all TB cases have been falling at an average of 7% per year since 1993. This rate of decline is biologically plausible, but surprising in view of the fact that DOTS expansion began only in 1995. The apparent trend in case notifications therefore needs to be verified. The smear-positive case detection rate by the DOTS programme was 58% in 2002, but questions about the dynamics of TB in the Philippines – raised by observations on the notification series – cast doubt on the accuracy of this estimate. Treatment success in the 2001 cohort was 88%, but 13% of patients completed treatment without documented smear conversion, and 6% defaulted.

TB first became a priority for the national government in 2002, and the first Philippine TB summit culminated in the signing of the Comprehensive and Unified Policy for TB Control in the Philippines in 2003. As a result of this policy, human resources for management at the central level of the NTP are sufficient. The number of managerial staff has increased from 8 to 12. Capacity was also increased regionally so that technical assistance can now be provided by the central level to provinces, and by provinces to local government units.

World TB Day and Lung Month were commemorated to increase political commitment. An advocacy campaign was launched in 2002, expanded in 2003, and will be continued in 2004 with new GFATM funding. The campaign promotes ownership of the TB problem by all sectors, including health care workers and the community, using social mobilization, community participation programmes, and a multi-media approach to increase local funding. Particular attention has been given to fostering ownership in the most peripheral administrative units, the barrangays. The broad goal is to increase demand for DOTS at all levels.

Implementation of an outpatient benefit package for TB control began in 2003, meaning that DOTS treatment for TB is now a reimbursable benefit in a pilot public-private financing scheme under the national insurance plan (PHILHEALTH). A PPM DOTS framework was developed, implementation of PPM DOTS clinics began in 2003, and operational guidelines for both public-initiated and private-initiated PPM DOTS are expected to be finalized in the first quarter of 2004. Funding for PPM projects is through the GFATM and the GDF. The Comprehensive and Unified Policy for TB Control will help to ensure adherence to the DOTS strategy by other public sector organizations including the Social Insurance System, the Indigenous Commission, and the Departments of National Defence, Education, Interior, Social Welfare, Labour, and Justice. Medical education institutions began to include DOTS training in their curricula in 2003.

Following decentralization, and consistent with the expected shift in responsibilities, the provinces have begun to make TB control a priority. Training workshops that reinforced new DOTS treatment guidelines were

PROGRESS IN TB CONTROL IN THE PHILIPPINES

Indicators

• Treatment success 2001 cohort	88%
• DOTS detection rate, 2002	58%
• NTP budget available, 2003	95%
• Government contribution to NTP budget, including loans, 2003	62%
• Government contribution to total TB control costs, including loans, 2003	93%
• Government health spending used for TB, 2003	3%

Constraints to achieving targets

- Inadequate supervision and monitoring of TB programme
- Under-use of DOTS services in some areas due to low public awareness
- Under-development of private sector partnerships for DOTS delivery

Remedial actions needed

- Establish supervision guidelines and reinforce central monitoring team
- Intensify advocacy for TB screening, diagnosis, and treatment
- Increase private sector involvement through widespread implementation of new DOTS treatment guidelines and PPM projects

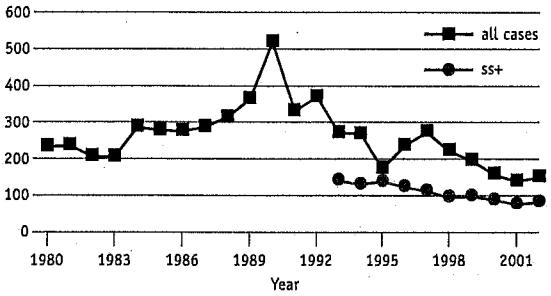
THE PHILIPPINES

LATEST ESTIMATES[a]	
Population	**78 580 228**
Global rank (by est. number of cases)	8
Incidence (all cases/100 000 pop)	320
Incidence (new ss+/100 000 pop)	144
Prevalence (ss+/100 000 pop)	224
TB mortality per 100 000 pop	57
% of adult (15-49y) TB cases HIV+	0.4
% of new cases multi-drug resistant	3.2

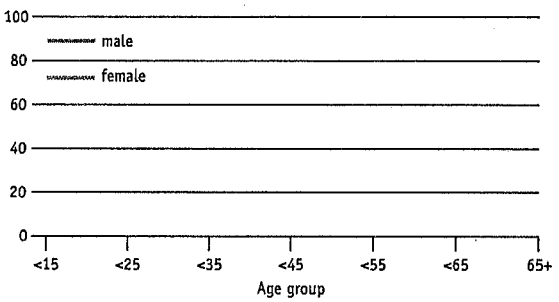
TRENDS	1999	2000	2001	2002
DOTS population coverage (%)	43	90	95	98
Notification rate (all cases/100 000 pop)	196	158	139	151
Notification rate (new ss+/100 000 pop)	99	89	77	83
Detection of all cases (%)	62	50	44	47
Detection of new ss+ cases (%)	69	62	54	58
DOTS detection of new ss+ (%)	19	46	54	58
DOTS detection of new ss+/coverage(%)	45	52	56	59
DOTS treatment success (new ss+, %)	87	88	88	—

Notification rate (per 100 000 pop)

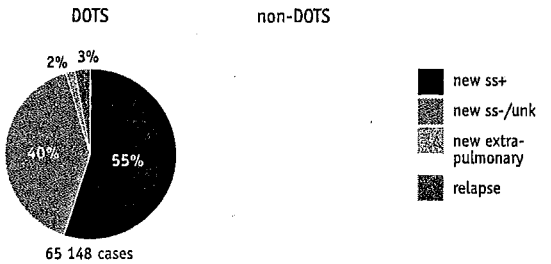
Notification (all cases) = 118 408 in 2002



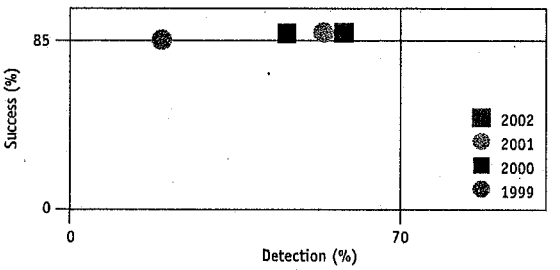
Notification rate by age and sex (new ss+)[b]



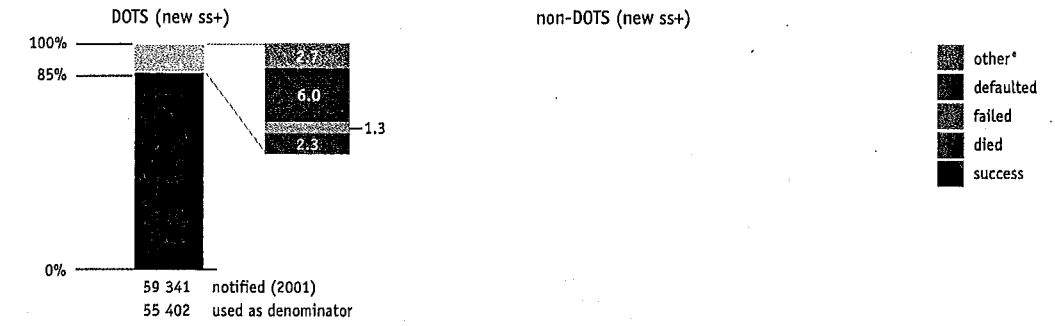
Case types notified[c]



DOTS progress towards targets[d]



Treatment outcomes[c]



Notes

ss+ Indicates smear-positive; ss-, smear-negative; pop, population; unk, unknown.

[a] See Methods for data sources.

[b] The sum of cases notified by age and sex is less than the number of new smear-positive cases notified for some countries.

[c] Non-DOTS is blank for countries which are 100% DOTS, or where no non-DOTS data were reported.

[d] DOTS progress towards targets: DOTS detection rate for given year, DOTS success rate for cohort registered in previous year.

[e] "Other" includes transfer out and not evaluated, still on treatment, and other unknown.

Budget estimates, existing funding and budget gaps for fiscal year 2003, US$ millions

	REQUIRED FUNDING	EXPECTED FUNDING				FUNDING GAP
		GOVERNMENT	LOANS	GRANTS	OTHER	
NTP budget						
Drugs	4.2	2.0	1.5	0.7	—	—
Dedicated staff working exclusively for TB control[a]	0.2	0.2	—	—	—	—
New activities to raise case detection and cure rates	1.9	0.2	—	1.4	—	0.3
Buildings, equipment, vehicles	NA	NA	—	—	—	—
All other line items	0.2	0.2	—	—	—	—
TOTAL NTP BUDGET	6.5	2.6	1.5	2.1	—	0.3
Costs not covered by NTP budget [b,c]						
Hospital stay	—	—	—	—	—	—
Clinic visits for DOT and monitoring	29.2	29.2	—	—	—	—
TOTAL COSTS NOT COVERED BY NTP BUDGET	29.2	29.2	—	—	—	—
TOTAL TB CONTROL COSTS	35.7	31.8	1.5	2.1	—	0.3

— Indicates zero; NA, not available

[a] There are 10 dedicated NTP staff at central level. At other levels dedicated NTP staff do not exist.

[b] WHO estimates, data not provided by the NTP

[c] Estimates differ from those in Global Tuberculosis Control 2003 due to a change in methods made possible by the availability of new data. See Methods section for full details.

held at provincial level, though follow-up is needed to ensure that the training leads to better monitoring and supervision. So far, it appears that the guidelines have not been fully implemented, and that training for provincial and district staff has been insufficient. Changes in local government every 3 years have meant that commitment to DOTS is fragile at this level.

At provincial and municipal levels, despite some increase in capacity, the workforce remains inadequate with about 20% of staff positions unfilled. There is a high turnover of staff caused by low salaries, overwork, and frequent administrative changes that lead to staff reorganization. Given that salary standardization does not allow sector-specific raises, proposed solutions include travel incentives and improved recognition of staff accomplishments.

The budget for anti-TB drugs was recently shifted from the centre to the regions. A private company was to have implemented an efficient drug procurement and distribution system, but did not do so because of contractual delays. Instead, drugs are now being procured through a new GDF mechanism, which has improved delivery of all drugs, including 4-drug FDCs.

A pilot survey to assess drug-resistance began in 2002 with support from WHO and JICA, and this survey was extended countrywide in 2003. New GFATM support that became available in 2003 is allowing continuation of a GLC-approved DOTS-Plus project that was first established in 2000 at the Makati Medical Centre in metropolitan Manila with a cohort of 200 patients. An additional 750 MDR-TB patients will be enrolled in the project between 2003 and 2007. The NTP is planning to expand DOTS-Plus to 2 more centres in 2004, in preparation for countrywide, community-based implementation as part of regular DOTS activities.

Diagnostic capacity is now supported by adequate staff. Partner support was mobilized in 2003 to enable expansion of the QA system and establishment of the laboratory network. JICA, in collaboration with WHO, is finalizing QA guidelines and a manual, with plans for implementation across the country by the end of 2005.

A national TB/HIV coordinating body has been established. Systematic testing of TB patients for HIV does not occur yet, but there is a plan to establish a system and to intensify the implementation of TB/HIV collaborative activities. By 2004, the NTP will be involved in delivery of ART for HIV-infected TB patients.

Partnerships

Through creative use of partnerships, the Philippines continues to be dynamic and flexible in adapting to the changing health system following decentralization, and in responding to fluctuations in financial and human resources. PACT (Project Assistance to Control TB) members, for example, have helped to monitor DOTS activities within, and outside of, their catchment areas. PACT contributed to establishment of the CCM that was required by the GFATM, enabling the Philippines more easily to manage new funds. Overall external technical collaborations are led by WHO, and it is through close collaboration between WHO and the Philippines government that support for partnership development has been fostered. During the expansion phase of DOTS now underway, technical quality of services has been maintained through support from JICA, USAID, the World Bank, World Vision

Canada, Spain's Medicos del Mundos, KNCV, and CDC. In addition to the technical and other support that they provide, the main financial donors in the Philippines are the World Bank, CIDA, JICA, USAID, and the GFATM.

Partnerships within the country have been facilitated by the formation of the Philippines Coalition Against TB (PHILCAT), comprising more than 50 NGOs and private sector groups that have worked together to reach consensus on TB control, especially in the private sector, and to mobilize local resources. The DoH, being part of PHILCAT, will improve private sector involvement in the DOTS strategy by conducting a series of training workshops for private physicians to educate them about DOTS, and to encourage referral of TB patients to public health centres and public-private mix DOTS (PPMD) centres. PHILCAT members will also be asked to participate in monitoring.

Budgets and expenditures

NTP expenditure in fiscal year 2002 (from 1 January) was US$ 6.1 million (US$ 53 per patient). Total TB control costs (NTP expenditure plus the cost of clinic visits not covered by the NTP budget) can be estimated at US$ 34.0 million, equivalent to US$ 296 per patient. The NTP budget for fiscal year 2003 was only slightly higher than the budget for 2002, at US$ 6.5 million. The NTP estimated that they would treat 120 000 patients during this period, equivalent to US$ 54 per patient. Most of the budget was for drugs and new activities to increase case detection and cure rates (primarily expansion of PPM-DOTS). Almost all of the required funding was available, mostly from the government, with only a small funding gap of US$ 0.3 million. If the NTP succeeds in treating 120 000 patients, then total TB control costs would amount to around US$ 35.7 million in 2003, equivalent to US$ 298 per patient.